

Seeking Structure in Social Organization:
Compensatory Control and the Psychological Advantages of Hierarchy

by

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Abstract

Hierarchies are a ubiquitous form of human social organization. I hypothesized that one reason for hierarchies' prevalence might be that core motivational needs for order and control make hierarchies psychologically appealing—because of the structure they offer—relative to other, less structured forms of social organization. This hypothesis is rooted in compensatory control theory (Kay et al., 2008), which posits that individuals have a basic need to perceive the world as orderly and structured. Therefore, personal and external sources of control are substitutable, inasmuch as they both serve the superordinate goal of believing that the world operates in an orderly fashion. An initial study confirmed that hierarchies are perceived as more structured and orderly relative to egalitarian arrangements. In five subsequent experiments, I threatened participants' sense of personal control to increase their need to rely on external structure. Participants who lacked control perceived more hierarchy occurring in ambiguous social situations (Study 2) and preferred hierarchy more strongly in business contexts (Studies 3-4). Two studies tested my account that hierarchies are appealing because of their structure. Preference for hierarchy was higher among individuals high in Personal Need for Structure (PNS), and control threat increased preference for hierarchy even among low-PNS participants (Study 4). Importantly, framing a hierarchy as unstructured reversed the previous effects, so that participants who lacked control now found hierarchy unappealing (Study 5). A final study found that hierarchy-enhancing careers were more appealing after control threat, even when those jobs were low-status (Study 6). I discuss how the compensatory control account for the allure of hierarchies complements and extends other influential theories of hierarchy maintenance, such as Social Dominance Theory and System Justification Theory.

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Introduction

In September, 2011, the group *Occupy Wall Street* congregated in Manhattan's Zuccotti Park in order to protest the increasing income disparity within the United States. Their slogan, "We are the 99 percent," was meant to draw attention to the vast majority's perceived lack of political and economic influence over public life relative to the 1% of top wage earners (e.g., in 2008 the top 1% averaged \$1.1 million/year income, versus \$31,244/year for the bottom 90%; Gilson, 2011). Members of *Occupy* advocated the leveling of economic differences and advocated for decision-making by consensus (Berrett, 2011). Yet for a movement with such egalitarian ideals—literally proclaiming "We have no leader"—it very quickly developed hierarchical structures and this increase in hierarchy seemed to occur as individuals lost the ability to control local events (Carlson, 2011). In this and other times of crisis, when people lose personal control over their lives, hierarchy often becomes appealing. For example, the terrorist attacks of September 11, 2001, resulted in a surge of support for hierarchy-promoting social structures such as police and the military (Jones, 2003). Lane (1959, p. 35) went so far as to argue that "many members of the working classes do not want equality" because it deprives them of order and meaning provided by the older, more hierarchical social order. It seems that the drive towards egalitarianism is often thwarted. In the current research, I propose that hierarchical social structures offer psychological benefits and that these benefits are one reason why hierarchies are so prevalent. In particular, I argue that core motivational needs for order make hierarchies psychologically appealing—because of the structure they offer—relative to other, less structured forms of social organization. Building off compensatory control theory (Kay, Gaucher, Napier, Callan, & Laurin, 2008), I threatened participants' sense of personal control to

increase their need for structure and tested whether this lack of control increased preferences for hierarchy as a method of social organizing.

Social Hierarchies

Hierarchies are a ubiquitous feature of social organization in both human and non-human societies; they develop quickly and spontaneously, among individuals and between groups (Eagly & Karau, 1991; Halevy, Chou, & Galinsky, 2011; Sadler & Woody, 2003; Sapolsky, 2005; Sidanius & Pratto, 1999; Weissbrod et al., 2013). As such, explaining the human propensity to form hierarchies has been a preoccupation of social science (Dumont, 1980; Sidanius & Pratto, 1996; Weber, 1947/1964). Even in the United States, the "American paradox" (Myrdal, 1944/1996) is that despite strong cultural ideals that emphasize equality (Bellah, Madsen, Sullivan, Swidler, & Tipton, 1996; Deutsch, 2006; A. P. Fiske, 1991; Kluegel & Smith, 1986; Norton & Ariely, 2011), and some attempts at creating flat organizations (e.g., Shaer, 2013; Silverman, 2012; Worthy, 1950), much of American society is strongly hierarchical in practice (Norton & Ariely, 2011; Jantti et al., 2006).

As a general definition, a hierarchy is a tiered arrangement of objects where some entities are higher or lower than other entities on a particular dimension. A *social* hierarchy is a vertically stratified relationship between two or more people or groups in which those at higher levels of the hierarchy have greater power and status than those at lower levels of the hierarchy (see also Magee & Galinsky, 2008). Those at higher levels of a hierarchy typically have greater decision-making authority, privileged access to material and symbolic resources, more rights and freedoms, and greater ability to make and enforce rules than those at lower levels of the hierarchy. Like previous theorists (Altemeyer, 1998; Duckitt & Sibley, 2009; Sidanius & Pratto, 1999), I also recognize that there are both *individual*- and *group*-based hierarchies. Individual-

based hierarchies occur within groups, where one or more individuals are valued more highly on some dimension (e.g., status, power; Magee & Galinsky, 2008). In contrast, group-based hierarchies occur between groups—such as men and women, or older and younger people—where one group is valued more highly than the other (e.g., Sidanius & Pratto, 1999).

Non-human hierarchies may have evolved because they provided a solution to recurrent problems of animal social organization (e.g., conspecific aggression; Clark & Faulkes, 1997). Similarly, human groups organized into hierarchies accrue numerous organizational and cognitive advantages (Abramitzky, 2011; Gould, 2002; Halevy, Chou, & Galinsky, 2011; Halevy, Chou, Galinsky, & Murnighan, 2012; Ronay, Greenaway, Anicich, & Galinsky, 2012; Tiedens, Unzueta, & Young, 2007; Zitek & Tiedens, 2012). Moreover, in addition to these functional benefits for the group as a whole, it is also easy to understand why higher-ranked individuals prefer hierarchies: By definition, being at the top provides access to material resources that others lack, an ancestral and contemporary benefit.

Beyond these pragmatic advantages, evidence suggests that hierarchies have become imbued with potent psychological significance as both those higher and lower in the hierarchy support its existence. Being at the top of a hierarchy satisfies a cluster of psychological needs related to power, status, dominance, and self-esteem (S. T. Fiske, 2011; Leary, Cottrell, & Phillips, 2001; Magee & Galinsky, 2008; Taylor & Lobel, 1989; Sidanius & Pratto, 1999). Although higher-ranked individuals accrue the most obvious benefits from hierarchies (e.g., power, status, resources), lower-ranked individuals often demonstrate significant support for hierarchies (Anderson, Willer, Kilduff, & Brown, 2012; Jost, Pelham, & Carvallo, 2002; Jost, Pelham, Sheldon, & Sullivan, 2003; Levin, Frederico, Sidanius, & Rabinowitz, 2002; Sidanius,

Levin, & Pratto, 1996). This suggests the possibility that hierarchies may provide some type of psychological benefit for individuals of all ranks, not just for those at the top.

The hypothesis that lower status individuals also benefit psychologically from being in a hierarchy is consistent with research under the umbrella of system justification theory (Jost & Banaji, 1994; Jost, Banaji, & Nosek, 2004), which holds that individuals are motivated to view their sociopolitical systems as legitimate. To the extent that hierarchies are commonly the way in which systems are organized, defending the status quo often entails defending hierarchies (Gaucher, Kay, & Laurin, 2010; Kaiser et al., 2013). For example, system justification research demonstrates that even disadvantaged individuals who live in socially-stratified systems will bolster and defend a variety of hierarchies including stratification systems based on gender (Glick & S. T. Fiske, 2001; Jost & Kay, 2005; Kay, Gaucher, et al., 2009; Laurin, Shepherd, & Kay, 2010), race (Jost, Pelham, & Carvallo, 2002), and economic circumstance (Kay, Czaplinski, & Jost, 2009; Kay & Jost, 2003; Malahy, Rubinlicht, & Kaiser, 2009). From a system justification perspective, therefore, support for hierarchies is often a means of fulfilling the broader motivation to believe that one's social systems are legitimate.

From this past research it is clear that hierarchies have functional benefits and can serve needs for system justification, power, and status. In addition to these advantages, however, I propose that hierarchies, regardless of whether or not they represent the current status quo, may also be well-suited to satisfying the specific psychological need to perceive one's existence as structured. By *structured*, I mean orderly, non-random, and predictable. That is, the structured nature of hierarchies may give them a type of psychological advantage over more equal forms of social organization, especially in circumstances when people lack personal control and needs for external structure are therefore especially salient.

Compensatory Control

People are often motivated to believe they have personal control over their lives (e.g., Burger & Cooper, 1979; Kelly, 1955; Rothbaum, Weisz, & Snyder, 1982; Seligman, 1975). Compensatory control theory proposes that one reason why desire for personal control is so encompassing is because it is a subgoal of a larger motivation to see the world as structured, orderly, and predictable (Kay, Gaucher, Napier, Callan, & Laurin, 2008; Kay, Whitson, Gaucher, & Galinsky, 2009). That is, the notion that one's life circumstances might be randomly determined often provokes anxiety (e.g., Glass, Singer, & Friedman, 1969; Laurin, Kay, & Moscovitch, 2008; Pennebaker & Stone, 2004) and belief that one has personal control is an especially effective means of affirming that the world is structured rather than random.

But when uncontrolled events occur and are observed, positive or negative, they can threaten perceptions of being in control of one's life. Events ranging from undeserved fortune (Gaucher, Hafer, Kay, & Davidenko, 2010) to natural disasters (Eccleston, Kaiser, & Kraynak, 2010; Napier, Mandisodza, Andersen, & Jost, 2006) can shake an individual's confidence in their personal control over outcomes. How then do people maintain beliefs in a structured world when their sense of personal control is threatened? To the extent that beliefs in personal control serve broader needs for structure and non-randomness, compensatory control theory proposes that when beliefs in *personal* control are challenged, people can cope by seeking *external* sources of control—that is, structure in the physical and social world (Kay et al., 2008; Kay, Shepherd et al., 2011; Whitson & Galinsky, 2008). In other words, compensatory control theory suggests that personal and external sources of control are substitutable, inasmuch as both types of control bolster perceptions that the world is structured rather than random or chaotic.

As an analogy (see Kay et al., 2008), imagine a glass that, when full, represents an individual's preferred level of structure. Under typical circumstances, people may be able to maintain a full glass by perceiving personal control over events. But because belief in personal control cannot be plausibly maintained at all times, there will be circumstances when the glass is no longer full, a psychologically aversive state. In order to refill the glass to its preferred level, individuals will often turn to external sources of structure. By drawing upon a combination of personal and external sources of control or structure, individuals can therefore keep their glass as full as possible. Seeing the world as structured overall also suggests that it is still manageable and navigable, providing a framework by which one can potentially regain lost personal control (Kay, Landau, & Sullivan, *in press*).

A burgeoning research literature has identified numerous examples of how people who lack personal control—and thus experience anxiety that the world is unstructured—compensate by affirming structure in other sources, re-establishing their global sense of structure. People who lack personal control perceive increased structure in random arrays (i.e., see pictures in static; Whitson & Galinsky, 2008) and believe more strongly in agents that impose structure on the world, such as a controlling god or a controlling government (Kay, Gaucher, Napier, Callan, & Laurin, 2008; Kay, Moscovitch, & Laurin, 2010; Kay, Shepherd, Blatz, Chua, & Galinsky, 2010; Shepherd, Kay, Landau, & Keefer, 2011). People lacking personal control also endorse scientific theories that suggest orderliness rather than randomness (Rutjens, van Harreveld, & van der Plight, 2010; Rutjens, van Harreveld, van der Plight, Kreemers, & Noordeweir, 2013; Rutjens, van der Plight, & van Harreveld, 2010), and folk beliefs that provide orderly explanations for negative events (e.g., that they are "a blessing in disguise") can foster a more global sense of control (Chipperfield et al., 2012). Individuals lacking personal control are also

more likely to prefer products that restore structure to one's personal life (Shepherd, Kay, Landau, & Keefer, 2011) or have clear, well-defined boundaries (Cutright, 2012).

According to compensatory control theory, people will at times engage in phenomena of compensatory control even when the compensatory outlet offers little or no material benefit to the individual. In fact, under control threat, people may prefer sources of structure that are seemingly negative to more positive but less structured options. For example, in one study (Rutjens et al., 2013, Experiment 3), individuals whose sense of control was threatened were given two descriptions of how a degenerative disease might ostensibly progress: structured or unstructured. The structured disease course described a process of cognitive decline that progressed through five invariant stages. The unstructured disease course also included cognitive decline but symptoms did not occur in discrete stages or a fixed order. Notably, the unstructured disease course had a more hopeful prognosis than the structured disease course, so this provided an especially conservative test of whether structure might be preferred under control threat even at the expense of other outcomes. For individuals under control threat, and thus motivated to restore order, 46% preferred the structured disease course, despite its more negative prognosis, compared to only 18% of the non-threatened participants. Other studies have demonstrated that when personal control is undermined, and people are confronted with inexplicably mysterious events, they will compensate by increasingly endorsing the existence of relatively nefarious sources of order, including powerful enemies (Sullivan, Landau, & Rothschild, 2010) and elaborate conspiracies (Whitson & Galinsky, 2008). It seems that when people are motivated to find ways to preserve their belief in an orderly and structured world, sometimes even negative order is preferred to positive disorder.

Compensatory Control and the Endorsement of Hierarchy

It is clear from these findings that when personal control is undermined people compensate by imposing structure on their external contexts. I argue that hierarchies—because they provide structure—are a particularly important means of compensatory control. This hypothesis would offer a novel explanation for the development and persistence of hierarchies, while complementing, bridging, and enriching other prevailing social psychology theories on hierarchies such as social dominance and system justification. I expand upon the implications for these social psychological theories in the discussion section. A critical question to answer first, however, is whether hierarchies are actually perceived as more structured than more equal arrangements; some research does suggest that that social groups, whether large organizations or intimate friendships, can be simultaneously egalitarian and structured (Krackhardt & Kilduff, 1999; Rothschild-Whitt, 1979), and hierarchies can certainly be unstructured (Abrahamson, 2002; Jordan, Sivanathan, & Galinsky, 2011; Maner & Mead, 2010). However, I reasoned that hierarchies may be *more* psychologically conducive to providing structure than egalitarian arrangements. Compared to equality, hierarchies more explicitly provide rules about who should be doing what and describe a predictable pattern of relations among group members. For example, a hierarchically organized workplace typically has managers and employees with well-defined roles; role differentiation and hierarchical differentiation tend to co-vary in organizations (Baron & Pfeffer, 1994; Chonko, 1982; Gruenfeld & Tiedens, 2010). Someone whose sense of personal control has been threatened thus might find hierarchy appealing as a means of re-establishing a more general sense of structure. Indeed, past theoretical work has proposed the possibility that hierarchies fulfill psychological needs for structure (Magee & Galinsky, 2008),

and correlational evidence suggests that needs for structure and hierarchy-enhancing ideology are related (Jost, Glaser, Kruglanski, & Sulloway, 2003; Van Hiel, Pandelaere, & Duriez, 2004).

The current work offers the novel hypothesis that one reason hierarchies are so prevalent is because they serve as a means of compensatory control. Although previous research has investigated the benefits of hierarchy for groups or organizations (e.g., Ronay et al., 2012), or the psychological benefits that accrue to dominant individuals (e.g., Magee & Galinsky, 2008; Sidanius & Pratto, 1999), relatively less work has examined intra-psychic processes that lead to support for hierarchies among even disadvantaged individuals and groups (though see, e.g., Jost & Major, 2001) and none have examined this from the perspective of compensatory control. Here, I attempt to offer one such intra-psychic process by demonstrating that hierarchy, by virtue of its ability to serve core psychological needs for structure, might have a psychological advantage over equality, especially when people experience a personal control threat.

Overview

I conducted six studies to test whether preferences for hierarchy can be explained through the processes of compensatory control. My first study established that hierarchy is perceived as more structured than more equal arrangements. Having established a strong link between hierarchy and a sense of structure, I next tested whether hierarchy can serve as a means of compensatory control by manipulating levels of personal control and then assessing the extent to which people are drawn to hierarchy. I tested whether threats to control lead people to perceive hierarchy in an ambiguous social interaction (Study 2), prefer more hierarchy in their workplaces (Studies 3-4), and find hierarchy-enhancing careers more appealing, even when those careers are low in status (Study 6). I also demonstrate the relationship between needs for structure and preferences for hierarchy through correlational and experimental evidence: Correlationally,

individuals high in Personal Need for Structure (PNS) preferred hierarchies more than those low in PNS (Study 4). Experimentally, I manipulated whether hierarchy was framed as structured or unstructured and observed whether this moderated its appeal following control threat.

Importantly, this framing moderated the previously found relationship: Framing hierarchy as unstructured reversed the previous effects, so that participants who lacked personal control now found hierarchy unappealing (Study 5).

Study 1: Hierarchy Offers More Structure

I have proposed that hierarchical social arrangements are perceived as offering more structure. But it is possible that structure is perceived to occur in groups organized either hierarchically or equally. Indeed, previous theory has speculated that hierarchical social arrangements are structured, but probably not more so than egalitarian groups (Magee & Galinsky, 2008). In contrast, I propose that, regardless of whether these different social arrangements differ in their degree of actual structure, hierarchical social groups are *perceived* as significantly more structured than more egalitarian social groups. Study 1, therefore, tested whether hierarchies are indeed perceived as more structured by gauging people's perceptions of how hierarchy and equality relate to structure, order, and other relevant concepts.

Method

Participants. I recruited 73 participants (64% women, ages 18-78, Median = 31 years) who were told this was a study on how social groups can be organized. In this and all subsequent studies, participants were English-fluent, adult American residents recruited via Mechanical Turk[®] (MTurk; <http://www.mturk.com>). MTurk is a crowdsourcing provider, that is, of individuals willing to work on online tasks such as commercial and academic research. Data obtained using MTurk are as reliable as traditional methods in terms of internal consistency and test-retest reliability (Buhrmester, Kwang, & Gosling, 2011). A review of studies examining the validity of MTurk samples concluded: "...evidence that Mechanical Turk is a valid means of collecting data is consistent and continues to accumulate" (Mason & Suri, 2012, p. 4). Furthermore, the current studies generally investigate hierarchy preference in workplace domains and the older, non-undergraduate samples available on MTurk meant that participants had more real work experience, which should make my findings more generalizable. Potential participants

accessed the MTurk website and were shown a study description and an informed consent letter, then accessed the questionnaire website. In all studies, participants each received \$0.50-\$0.75 in appreciation for their time and received a debriefing feedback sheet at the study's end that explained the study's purpose.

Procedure and materials. After providing demographics information, participants were given a number of words (Figure 1) and phrases (Figure 2) related to structure, order, predictability, and other concepts. Based on Fehr (1988, Study 2), they rated how central each word or phrase was to “hierarchy” and “equality,” using an 8-point scale (1 = *Extremely poor description of hierarchy/equality*, 8 = *Extremely good description of hierarchy/equality*). I defined *hierarchy* as "a group of people where some are 'above' and some are 'below' in some way" and *equality* as "a group of people where everybody is on the same level". To counterbalance, half of participants rated the concept of hierarchy first and equality second; the order was reversed for the other half of participants. There were no effects of order, all *p*-values > .13.

After rating the words' and phrases' relationships to equality and hierarchy independently (i.e., on unipolar scales), each participant then rated the same words and phrases as opposite concepts on a bipolar 7-point scale (1 = *Much more characteristic of equal social groups*, 7 = *Much more characteristic of hierarchical social groups*), with the midpoint (4) labeled *Equally characteristic of both hierarchy and equality*. Participants could also choose *unrelated to either concept*, which was coded as no response. I included this bipolar scale because I considered that some phrases, when rated independently, might be seen as equally related to hierarchy and equality but that differences might still emerge when the two concepts were placed in juxtaposition on the same response scale. These results from the bipolar scale, however, were

generally the same as when they were assessed independently and therefore I only present the independent ratings below.

Results & Discussion

Data were analyzed using paired *t*-tests. As shown in Figures 1 and 2, there were dramatic differences in how hierarchical and egalitarian social groups were perceived. The words that were rated are shown in Figure 1. Supporting my hypotheses, hierarchy was rated as more *structured, predictable, stable, well-controlled, well-coordinated, resistant to change, and efficient*, all *p*-values < .05. In contrast, equality was rated as more *fair* and *natural*, but also more *chaotic* and *unpredictable*, all *p*-values < .05. Neither concept was rated as more *dependable* or *safe*, all *p*-values > .15. The phrases that were rated are shown in Figure 2 and hierarchies were more associated with role differentiation and the status quo, but not participants' ideals about how groups should be organized.

In sum, hierarchy was seen as more structured, orderly, and predictable, compared to equality. Study 1 also found some of the perceived practical benefits of hierarchies identified in previous research (e.g., efficiency; Halevy, Chou, & Galinsky, 2011). It is also noteworthy—and consistent with the "American paradox" (Myrdal, 1944/1996)—that *fairness* was more characteristic of equality, and equality was more strongly seen as *the way people should be organized*. Having established the general premise of my hypothesis, next I experimentally investigated whether hierarchy, as a source of social structure, can serve as a means of compensatory control. Though people prefer equality as an ideal in the abstract, their preferences may shift to hierarchy when they experience an acute threat to personal control.

Figure 1: Mean ratings (Study 1) of the extent that each word was associated with hierarchical or equal social groups. By paired *t*-test, all differences significant, $p < .05$, except *dependable* and *safe*. Scale range: 1-8, higher rating indicates more association with the concept.

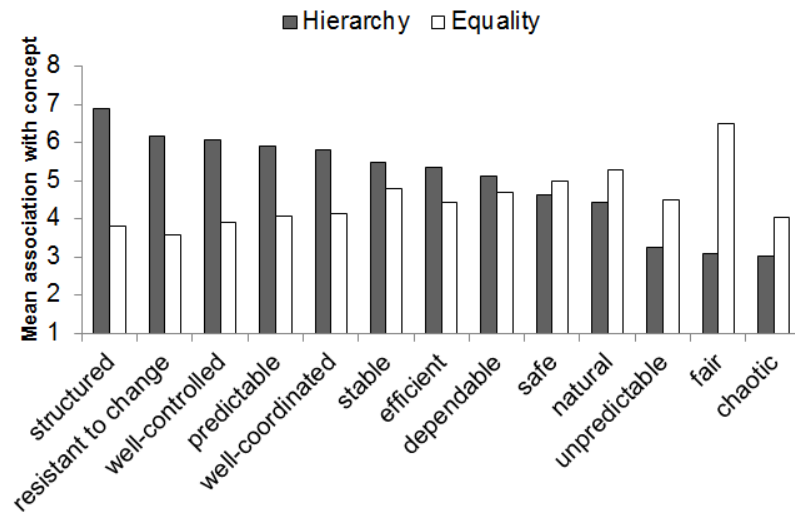
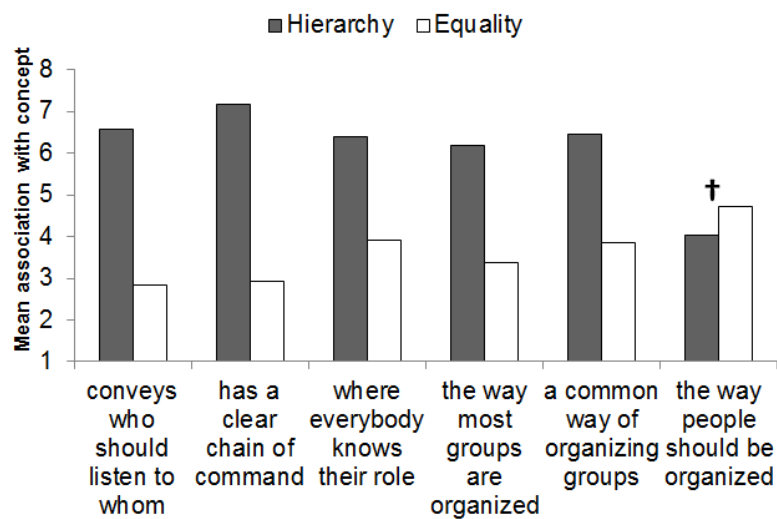


Figure 2: Mean ratings (Study 1) of the extent that each phrase was associated with hierarchical or equal social groups. By paired *t*-test, all differences significant, $p < .001$, except † indicating $p < .10$. Scale range: 1-8, higher rating indicates more association with the concept.



Study 2: Perceptions of Hierarchy

Study 1 established that hierarchies are seen as more structured. It is feasible, then, that social hierarchies may serve as a convenient means of imposing structure on everyday social organization. To the extent that activated psychological motives guide the interpretation of ambiguous stimuli (e.g., Bargh 1984; Srull & Wyer, 1979), I predicted that people would perceive more hierarchy in an ambiguous social situation after their sense of personal control has been undermined (and their need for structure thereby enhanced; Kay et al., 2008). Study 2 tested this hypothesis by threatening personal control and having participants rate the amount of hierarchy occurring in descriptions of two different hypothetical group interactions: undergraduate students working on a project and working adults planning a vacation.

Method

Participants. I recruited 103 participants who were told this was a study on past experiences and how people perceive social interactions. Four participants were excluded (see below), leaving 99 (72% women, ages 18-72, Median = 28.5).

Participant screening. While the most important motivations reported by MTurk workers are intrinsic enjoyment of entertaining tasks or "killing time" (Buhrmeister, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010), like in any paid sample there are individuals who participate only for the remuneration and attempt to complete each task as quickly as possible, without reading manipulations or questions. Therefore, I used the following quality control techniques, which are based in part on Mason and Suri's (2012) recommendations: (i) manual examination for response patterns that indicated a failure to follow study directions or not taking the experiment seriously, such as giving the same answer to all multiple-choice questions or writing nothing in the open-ended manipulations; (ii) a voluntary

disclosure question at the study's end asking participants whether they answered with care and diligence, explicitly stating that there would be no penalty for answering no; (iii) "red herring" questionnaire items embedded in other measures, such as "For quality control purposes, answer 'strongly disagree' for this item"; (iv) for studies that included an article manipulation, the survey website recorded the time spent reading it. Participants who spent fewer than 5 seconds on that page were excluded¹.

Procedure and materials. Participants first completed a personal control manipulation that past research has demonstrated engenders a search for structure (Whitson & Galinsky, 2008). In this and all subsequent studies participants were randomly assigned to conditions. Participants in the *control threat* condition ($n = 48$) recalled and wrote about a time where they lacked control: "Please recall a particular incident in which something happened and you did not have any control over the situation. Please describe the situation in which you felt a complete lack of control – what happened, how you felt, etc., in up to 100 words." Participants in the *control unthreatened* condition ($n = 51$) wrote about a time when they had control. In past compensatory control research, participants who wrote about a time when they had control did not differ from participants who were assigned a neutral writing task where they wrote about a topic unrelated to control (Cutright, 2012).

Next participants read one of two passages describing a social interaction among three people in which the extent of the hierarchy was ambiguous. For example, individuals in the groups were presented as peers but in each scenario one or two characters tended to take the lead in planning, which is suggestive of dominance, while other characters deferred to those plans,

¹ I also analyzed the data from all studies when no participants were excluded. In all studies the pattern of results remained the same as reported. In Studies 3 and 6 all reported p -values of interest remained below $< .05$. In Study 2 all p -values of interest remained $< .06$. In Studies 4 and 5 all p -values of interest were $< .20$.

which is suggestive of submissiveness (Sadler & Woody, 2003). I used two different passages to ensure that any effects occurring were not due to some unique feature of a particular scenario.

The instructions read: "Here we are interested in how people perceive individuals in interactions with others. Below you will see a short story. Please read it carefully because afterward we will test your memory and ask you some questions about what occurred." Half of participants

($n_{threatened} = 22$, $n_{unthreatened} = 25$) read the following *group project* scenario:

Rebecca, Jacob, and Alex met in the library to work on their group project—a presentation for their psychology class. The three of them had seen each other in class, but this was the first time they'd spoken outside of class. Alex made a suggestion based on last week's lecture but Jacob didn't think it was a good idea. Alex insisted on it and the two argued for a few minutes. Finally, Rebecca put forth an alternative, which Jacob loved. Alex agreed too, reluctantly. Alex didn't like Rebecca's idea but went along anyway just to be done with it. Rebecca said, "Let's do some internet research together right now, then write down a few ideas." Alex really wanted to divide up the work and do it on his own, instead of as a group, but didn't say anything.

The remaining participants ($n_{threatened} = 26$, $n_{unthreatened} = 26$) read a *vacation planning* scenario:

John and Linda were meeting their friends Bob and Patricia for card night. The four greeted each other warmly at the door. John and Linda sat down at the table while Bob started shuffling the cards. Patricia left to get drinks. Bob and John started discussing where the two couples would take their joint summer vacation this year. Traditionally they went camping in the mountains but Bob suggested they visit the beach instead. John was quite clear: "I'm sorry, but we hate the beach." Linda actually thought to herself that she liked the beach, but didn't want to speak up. Bob kept pushing the beach, and listed a number of reasons why it might be good to try something new. Eventually John agreed that they would try it this year.

My dependent measure was the amount of hierarchy that was perceived to have occurred during the interaction. This was measured by having participants answer four questions about each character: "How much did each character contribute to the decision?"; "How much control did each person have in this situation?"; "How much influence did each person have in this situation?"; and, "How much did each person dominate in this situation?" Responses were on a

5-point scale (1 = *Nothing at all* to 5 = *Complete*). The reliability of the ratings of each character ranged from $\alpha = .68$ to $.85$ ($M_\alpha = .80$ for the six characters).

I operationalized the amount of hierarchy occurring as the mean *variance* in the ratings. That is, if the interaction was perceived as highly hierarchical, presumably one or two of the actors would be perceived as highly dominant (controlling, etc.) while the remaining actors would have been seen as less dominant. If so, there would be high variance in the dominance ratings between the three actors. In contrast, if the scenario was seen as more egalitarian, no actor should have been rated as more dominant than the others. Here there should have been low variance in the dominance ratings between the three actors. Therefore, as my measure of the amount of hierarchy occurring in each scenario, I calculated the variance in the three characters' ratings on each of the four dimensions individually, and the mean of those four variances was used as the dependent measure ($M = 2.46$, $SD = 1.26$, Range = 0 to 4.75).²

Results & Discussion

Mean variances were submitted to a 2 (Control threat condition: *control threatened* vs. *unthreatened*) by 2 (Scenario type: *group project* vs. *vacation planning*) between-subjects ANOVA³. As predicted, there was a main effect of control threat condition, $F(1, 95) = 4.11$, $p =$

² For example, for the question, "How much did each person contribute to this decision?" a participant in the group project scenario might have rated Rebecca as contributing 5 (*completely*), Jacob as 2 (*somewhat*), and Alex as 1 (*nothing at all*); this would produce a variance of 4.33 for that dimensions, a high level of perceived hierarchy. In contrast, a participant who rated each character contributing 2 (*somewhat*) would have a variance of 0 on that dimension, a low level of perceived hierarchy. The mean variance of all four dimensions (*contribute*, *control*, *influence*, and *dominance*) was used as the dependent variable.

³ Because the dependent variable was based on variances, I tested whether the distribution of scores was normally distributed and had homogeneity of variance across threat conditions to ensure the assumptions of ANOVA were met. Skewness was $-.12$ ($SE = .24$) and kurtosis was $-.76$ ($SE = .48$), indicating that the dependent variable was normally distributed. Levene's test for equality of variances was not significant, $p = .92$, indicating variances in the dependent variable did not differ across experimental conditions.

.04, $\eta^2_p = .04$, so that there was more variance in ratings (i.e., participants perceived more hierarchy in the interaction) when control was threatened ($M = 2.70$, $SD = 1.24$) than when it was unthreatened ($M = 2.23$, $SD = 1.25$). There was also a difference between scenarios so that participants also reported more variance in ratings for the vacation planning scenario ($M = 3.13$, $SD = 0.96$) than the group project scenario ($M = 1.72$, $SD = 1.14$), $F(1, 91) = 45.27$, $p < .001$, $\eta^2_p = .33$. However, the lack of two way interaction, $F < 1$, indicated that the effect of control threat was consistent across both scenarios.

Participants whose personal control was threatened were more likely to impose hierarchies—social structure—onto an ambiguous group interaction. Thus Study 2 suggests a tendency to see hierarchy in the social world when compensatory control needs are salient. To the extent that people lacking control are perceiving hierarchy where there might be none, it suggests an avenue for how hierarchies might initially develop.

Study 3: Preferences for Hierarchy

Next I sought to move beyond *perceptions* of hierarchy and investigate *preferences* for hierarchy. In past research, people compensated for a lack of personal control by preferring products (Shepherd, Kay, Landau, & Keefer, 2011) and beliefs (Kay et al., 2008; Rutjens et al., 2010, 2012) that provided structure. In Studies 3-6 I investigated whether hierarchy, as a means of social organization that provides structure, might be increasingly preferred by people when a primary means of imbuing the world with structure—that is, personal control—is threatened.

To manipulate personal control I had participants read one of three articles that described (i) the economy as uncontrolled (ii) the world more generally as random, or (iii) an article unrelated to control. I then measured participants' preference for hierarchy in workplace contexts. I included two control threat articles because I wanted to test the influence of both domain-specific control threats (i.e., the economy is uncontrolled) and more general control threats (i.e., the world is uncontrolled) on preference for hierarchy. I expected that both types of threat would increase preference for hierarchy relative to the neutral condition.

In Study 3 I also included a neutral comparison group to more clearly test the direction of the effects of personal control on hierarchy preference. It could be argued that in Study 2, writing about having control was actually an *affirmation*, and that affirmation *reduced* preference for hierarchy rather than threat increasing preference for hierarchy. This hypothesis would not be consistent with past research that showed writing about lacking control increases compensatory control processes relative to both participants who wrote about having control and participants who wrote about a neutral topic unrelated to control (Cutright, 2012). Including a neutral comparison group here, however, would more clearly establish the direction of effect.

Method

Participants. I recruited 172 participants who were told this was a study on factors that influence workplace organization and career choices. Four were excluded, leaving 168 participants (56% male, ages 18-72, Median = 28).

Procedure and materials. Participant first completed premeasures of their employment category (employed, unemployed, or student) and employed participants reported their workplace status at their current job. Workplace status was measured by two items: "Think about your current job and your place in the workplace ladder. Where would you place yourself ... in your workplace as a whole?" and "...in your current department or workgroup." These were answered in on a 0-100 sliding scale (0 = *lowest rank* to 100 = *highest rank*). The two items were correlated, $r(105) = .66, p < .001$, so their mean was used as the measure of workplace status ($M_{workplace} = 38.9, SD = 24.6, M_{department} = 54.4, SD = 27.6$).

To manipulate personal control, participants read one of three articles ostensibly from a magazine: an *economic control threat* ($n = 52$), a *general control threat* ($n = 55$), or a *neutral article* ($n = 61$). The economic control threat passage was a modified version of one used in past research (Whitson & Galinsky, 2008)⁴. It stated:

In today's economic climate, circumstances are very volatile. Even analysts admit that it's hard to predict which companies will do well and which will do poorly. Fortune magazine recently had a headline that says, "Rough Seas Ahead for Economy." The Wall Street Journal used a similar but different metaphor – "Today's economy is like walking through a minefield." In light of the volatility of the economy, we feel it's important to learn about workplace organizational preferences.

The general control threat (Banfield, Nadolny, & Kay, 2013) read:

Is Everything Under Control? A Harvard Conference Reveals the Answer
"The world really is a random place," said Thomas Cornwallis, a statistics professor at Oxford. Cornwallis made the comments at a conference hosted by Harvard University in January. The conference, titled "Understanding the World" was aimed at trying to

⁴ The original passage referred to the volatility of the stock market; the current version referred to the economy more generally in order to be more consistent with the current cover story.

understand the causes of events in the world. Cornwallis was one of several panelists who agreed that the world mostly operates in erratic, unpredictable ways.

At the same conference, Marten Keese, a professor at Utrecht University in the Netherlands, spoke about an article he published in the renowned journal *Science*. Keese claimed that people's behaviour does not have clear causes. Although people may believe that the world is orderly and non-random, Keese says our perceptions are flawed. "Unperceived factors determine what happens to us. Most people believe their outcomes are under control, but our data suggest that random fluctuations have greater effects."

The neutral passage was designed not to threaten control but have a similar journalistic or academic tone:

American Farmers Doing Fine

A recent study by the United Nations suggests that American farmers continue to make a living in their profession. The UN report studied 78 countries around the world to assess the quality of life of farmers.

The report was spearheaded by a UN representative from Ireland, Clive O'Connell, who initially expressed concern that farmers in underdeveloped countries may not be making a sufficient living. On the contrary, O'Connell found evidence that farmers in both developed and underdeveloped countries produce enough to live existences considered "comfortable" by the standards of their countries. The report included data from 1990-2011, and the trends indicate that farming continues to be a sensible career choice.

The dependent variable was a 6-item measure of preference for hierarchy in the workplace ($\alpha = .59$)⁵. The items were loosely based on the Social Dominance Orientation scale (Pratto, Sidanius, Stallworth, & Malle, 1994) but modified to reflect preference for hierarchies in a workplace context. They were: "In a business, it's important for one person to make final decisions"; "Businesses are most effective when there are a few people who have the influence to get things done"; "In any business, some people will naturally have more power than others"; "Every company needs a boss who is in charge of everybody else"; "To get things done, it's sometimes necessary to overrule other people"; and, "A business is most effective if every

⁵ Dropping item 6 improved scale reliability somewhat ($\alpha = .63$). Patterns and significance levels using this shortened scale were essentially the same as those reported.

employee has some say into how it's run" (reverse scored). Items were rated using a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*). After the dependent variable was a manipulation check item: "Which statement most represents your general opinion about the state of the economy today?" on a 0 to 100 sliding scale (0 = *Is stable and predictable* to 100 = *Is volatile and unpredictable*). Lastly, participants completed demographics information and were shown an online debriefing and feedback page. The feedback page stated that the study had contained deception (i.e., that the articles were not from newspapers but had been created for use in research) and, given the deception, participants were asked to give post-debriefing consent to the use of their data. All participants consented to the use of their data and none disclosed concern about the deception in the comment box that was provided.

Results

Data were analyzed using one-way ANOVA and 3 levels of the independent variable (*economic control threat*, *general control threat*, and *neutral*). I analyzed the manipulation check using a planned contrast comparing the two threat conditions ($M_{\text{economic threat}} = 77.3$, $SD = 15.5$; $M_{\text{general threat}} = 72.9$, $SD = 15.7$) to the neutral condition ($M = 69.5$, $SD = 17.6$), which was significant, $t(164) = 2.08$, $p = .04$. This indicated that the threat articles significantly increased participants' perceptions that the world is unpredictable, relative to the neutral article. A second planned contrast that tested the difference between threat conditions was nonsignificant, $t(164) = -1.34$, $p = .18$.

Next I analyzed the main dependent variable, preference for workplace hierarchy, on which I expected an effect of threat. A planned contrast that compared the two threat conditions ($M_{\text{economic threat}} = 5.05$, $SD = .74$; $M_{\text{general threat}} = 4.84$, $SD = .77$) to the neutral condition ($M = 4.66$, $SD = .63$) was significant, $t(165) = 2.41$, $p = .02$, which indicated that, as predicted, the personal

control threats increased preference for workplace hierarchy. A second planned contrast that tested the difference between threat conditions was nonsignificant, $t(165) = -1.46, p = .15$.

I conducted supplementary analyses to investigate whether control threat only affected participants high in workplace status, which might suggest that the benefits of hierarchy's structure are limited to high-status individuals. To do this I tested whether participants' own workplace status ($M = 46.7, SD = 23.7$) moderated the threat effect among employed participants ($n = 108, 64\%$ of sample). Using multiple regression, preference for hierarchy was regressed on mean-centered workplace status, coded predictors representing the same planned contrasts for the condition effects (Contrast 1: *economic threat* = -1, *general threat* = -1, *neutral* = 2; Contrast 2: *economic threat* = -1, *general threat* = 1, *neutral* = 0), and their interaction terms. Only Contrast 1 comparing the two threat conditions versus neutral was significant, $b = .18, \beta = .39, t(102) = 4.12, p < .001$, all other t 's < 1 , which suggests that lacking control caused individuals to increase their preference for workplace hierarchy regardless of their own workplace status.

Study 3 suggested that people will compensate for a lack of personal control by more strongly endorsing hierarchies in the context of the workplace. Thus, not only do people *perceive* more hierarchy following control threat (Study 2), but they also *prefer* it. Together, these studies demonstrated my basic hypothesized effect⁶. They have not, however, specifically addressed the proposed mechanism, which is that hierarchy becomes appealing after control threat, at least in part, because of the structure it offers instead of other potentially appealing characteristics (e.g.,

⁶ I conceptually replicated Study 3's effect of personal control threat on preference for workplace hierarchy in a separate sample of participants ($N = 84$) using the manipulation of personal control from Study 2 (Whitson & Galinsky, 2008) and the measure of hierarchy preference from Study 3 ($\alpha = .64$). Participants recalled and wrote about a time when they lacked personal control or a time when they had personal control. Threatened participants ($n = 42$) showed more preference for workplace hierarchy ($M = 5.17, SD = .82$) than unthreatened participants ($n = 42, M = 4.86, SD = .83$), $t(82) = 1.75, p = .08, d = .38$.

power, status), and thus is able to serve as a means of compensatory control. That is, it could be argued that the participants who lacked control preferred hierarchy because of the status it offers, and that they were visualizing being in a high-status position. While this alternative seems less plausible given that the effect of the manipulation in Study 3 was not moderated by perceptions of workplace status, I more definitively rule out this alternative in Study 6. Next, however, I examine the connection between personal control and structure specifically in Studies 4-5.

Study 4: The Need for Structure and the Need for Hierarchy

Study 4 assessed the effects of both a personal control threat manipulation and a chronic individual difference measure directly related to the need for structure—Personal Need for Structure (PNS; Neuberg & Newsom, 1993; see also Webster & Kruglanski, 1994)—on preferences for hierarchy. If hierarchy is preferred in part because of the structure it confers on the social world, then people who chronically seek out structure—those high in PNS—should prefer hierarchy more strongly than people less predisposed to prefer structure.

I also tested whether this chronic individual difference would interact with control threat. Past research has demonstrated that motivational threats elicit a particular motivation most strongly among individuals whose chronic levels of that particular motivation are lower. In effect, threat makes the motivation salient for everyone. Commonly, following threat, the responses of those low on a particular chronic motivation begin to more closely resemble highs (Banfield, Kay, Cutright, Wu, & Fitzsimons, 2011; Nail & McGregor, 2009; Nail, McGregor, Drinkwater, Steele, & Thompson, 2009; but see Landau et al., 2006). Thus, to the extent that both (i) hierarchy is attractive because it offers structure and (ii) control threat leads to preferences for hierarchy because it increases the need for structure, I expected that in baseline conditions people high in PNS should demonstrate a greater preference for hierarchy than those low in PNS, and under control threat low PNS individuals should show a preference for hierarchy that more closely matches their high PNS counterparts.

Method

Participants. I recruited 95 participants who were told this was a study on past experiences and how businesses should be organized. Ten participants were excluded, leaving 85 (61% women, ages 18-70, Median = 33).

Materials and procedure. Participants first completed the 11-item Personal Need for Structure scale ($\alpha = .87$; Neuberg & Newsom, 1993), which includes items like, “I enjoy having a clear and structured way of life,” and “I don’t like situations that are uncertain.” These items were rated using a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*). Next, participants completed a personal control manipulation (Kay et al., 2008) in which they recalled and wrote about a time when they lacked personal control or when they had personal control, similar to the manipulation used in Study 2 but developed independently. In the *control threatened condition* ($n = 43$) participants read: “Please try and think of something positive that happened to you in the past few months that was not your fault (i.e., that you had absolutely no control over).” Participants in the *control unthreatened condition* ($n = 42$) recalled a positive experience from the same time period but that they had control over. In past research this manipulation affected feelings of perceived personal control but not mood or self-esteem (Kay et al. 2008). Although I did not formally code the open-ended responses, many were similar in content across conditions but differed in whether they were construed as uncontrolled or not. Participants wrote uncontrolled events like an unexpected bonus at work, a lottery windfall, or surprise concert tickets from a friend; or controlled events like a work promotion, a profitable stock investment, or an extra night out with friends.

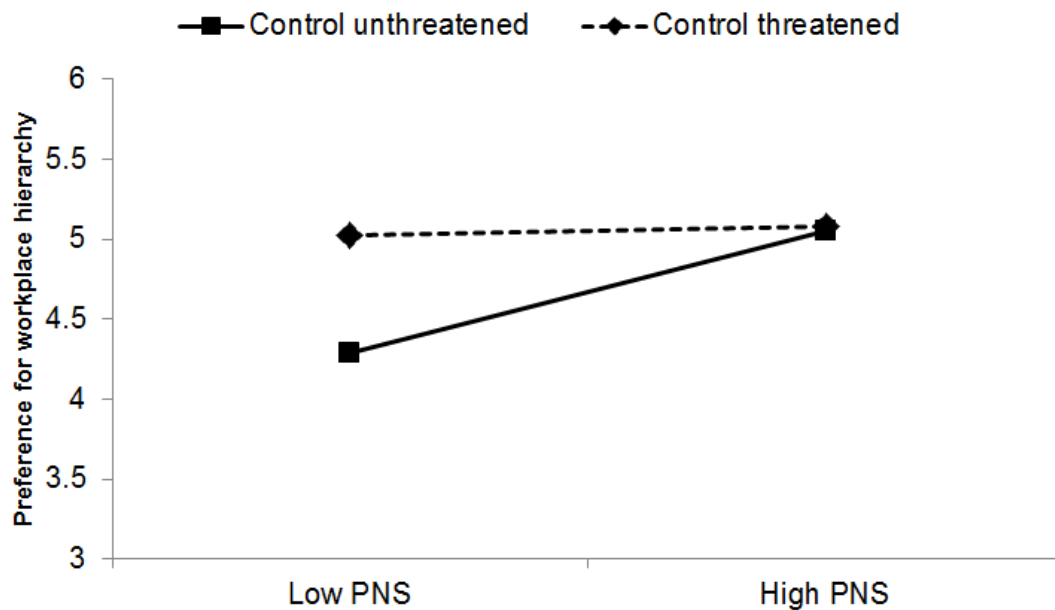
Comparing this manipulation to the one used in Study 2 (Whitson & Galinsky, 2008), they are substantially the same recall task with minor wording differences, except that this study’s manipulation specifies that the memory recalled should be a positive event. Although many real-world instances of lost personal control are likely negative, according to compensatory control theory any loss of personal control—even resulting from positive events like undeserved fortune—can increase needs for structure and strivings for compensatory control

(Gaucher et al., 2010; Kay et al., 2008). Therefore I included this positively-framed manipulation in order to ensure (in combination with Study 3 where an article manipulation was used) that the effects of control threat on hierarchy preference are not limited to just one operationalization of control threat. Following the personal control manipulation, participants completed the 6-item measure of preference for hierarchy in workplace contexts employed in Study 3 ($\alpha = .68$).

Results & Discussion

Data were analyzed using multiple regression. I regressed preference for hierarchy in the workplace on control threat condition (effect-coded: -1 = *control unthreatened*, 1 = *control threatened*) and mean-centered PNS ($M = 4.55$, $SD = 1.00$). As predicted, two main effects emerged. First, there was an effect of the threat manipulation, $b = .19$, $\beta = .21$, $t(82) = 1.96$, $p = .05$, so that participants who lacked control ($M = 5.04$, $SD = 0.90$) preferred more hierarchy than those who had control ($M = 4.66$, $SD = 0.90$). Second, PNS positively predicted desire for hierarchy in workplace contexts, $b = .19$, $\beta = .21$, $t(82) = 1.95$, $p = .05$. As shown in Figure 3, however, adding the 2-way interaction term qualified these effects (albeit marginally), $b = -.18$, $\beta = -.20$, $t(81) = -1.86$, $p = .07$. Simple effects analyses (Aiken & West, 1991) revealed that low-PNS participants' desire for hierarchy increased significantly after control threat compared to no threat, $\beta = .40$, $t(81) = 2.72$, $p = .01$, bringing them in line with high-PNS participants, who were simply chronically high in the desire for hierarchy and not affected by control threat, $t(81) < 1$. Put another way, higher levels of PNS led to higher levels of preference for hierarchy only when control was unthreatened, $b = .38$, $\beta = .42$, $t(81) = 2.71$, $p = .01$, and not when it was threatened, $b = .03$, $\beta = .03$, $t(81) < 1$.

Figure 3. Effects of personal control threat and Personal Need for Structure on preference for hierarchy (Study 4). PNS plotted at ± 1 SD about the mean. Scale range: 1-7.



Thus, as predicted, individuals chronically high in the need for structure preferred hierarchy more than individuals low in PNS, and this effect was moderated by control threat in theoretically consistent ways (Banfield, Kay, Cutright, Wu, & Fitzsimons, 2011; Cutright, 2012; Nail & McGregor, 2009; Nail et al., 2009). The main effect of threat conceptually replicates Study 3, where participants whose sense of control was threatened preferred hierarchy more than participants who were unthreatened. The interaction of control threat with PNS is consistent with my proposal that lacking control leads to preferences for hierarchy because of the connection between hierarchy and structure. Specifically, the interaction suggests that both the chronic individual difference and the threat are tapping into the same motivational process that can either be strong chronically or elicited situationally.

Study 5: When Hierarchy is Unstructured

Although hierarchies are often perceived as more structured than equality (Study 1), they are not necessarily so (Abrahamson, 2002). Within a business hierarchy, for example, regular promotions, demotions, and reorganizations might introduce elements of instability. Under these conditions of instability, a hierarchy can become unstructured and disorderly (Jordan, Sivanathan, & Galinsky, 2011; Maner & Mead, 2010; Sapolsky, 2005). For people lacking personal control, and thus looking to reestablish structure in their social circumstances, a disorganized hierarchy should not be appealing. Indeed, it might be particularly unappealing. A finding that control threat decreases the attractiveness of disorderly hierarchies would provide an important boundary condition, demonstrating that hierarchies are only able to serve as a means of compensatory control when they are perceived as structured.

Method

Participants. I recruited 155 participants but 14 were excluded, leaving 141 (54% women, ages 18-61, Median = 28).

Materials and procedure. Participants first completed the manipulation of personal control used in Study 5, in which they completed a writing task that threatened personal control or did not threaten personal control (Kay et al., 2008). Next they viewed an instruction page. For half of participants ($n_{threatened} = 33$, $n_{unthreatened} = 36$) the following framing manipulation was included to challenge the belief that hierarchies are structured. To ensure that the passage was not wholly negative, it also mentioned several positive consequences of lacking structure (i.e., flexibility, adaptability).

As you consider your preferences, keep in mind that although hierarchical groups might appear orderly on the surface, it's possible for them to be quite unstructured in practice. In a hierarchical company, employees often jostle for power which prevents employees from knowing their roles in fulfilling the company's overall goals. In these cases the

guidelines for each person's duties are often unclear. However, conflict can motivate employees to put in more effort and can create a flexibility that allows the company to more easily adapt to new conditions.

The remaining participants ($n_{threatened} = 36$, $n_{unthreatened} = 36$) did not read this passage. All participants then completed two dependent measures assessing their preference for hierarchy within a workplace context. First was the measure of *general* preference for workplace hierarchy used in Studies 3 and 4 ($\alpha = .67$). Second was a new measure of *personal* preference for workplace hierarchy (5 items, $\alpha = .88$). This scale focused on participants' willingness to invest in and be part of a hierarchical organization. Participants responded to each item using a 7-point scale (1 = *A more equal company*, 7 = *A more hierarchical company*): "If you were going to invest some money, would you rather invest in..."; "If you were going to work at a company and start at the bottom, would you rather work at..."; "If you were going to be in management at a company, would you rather work at..."; "Which type of company seems more profitable?"; and, "Which type of company seems like a better place to work at?" The two scales were significantly correlated, $r(139) = .57$, $p < .001$, so I standardized them separately and combined into a single dependent measure⁷. Last, participants completed demographics.

Results & Discussion

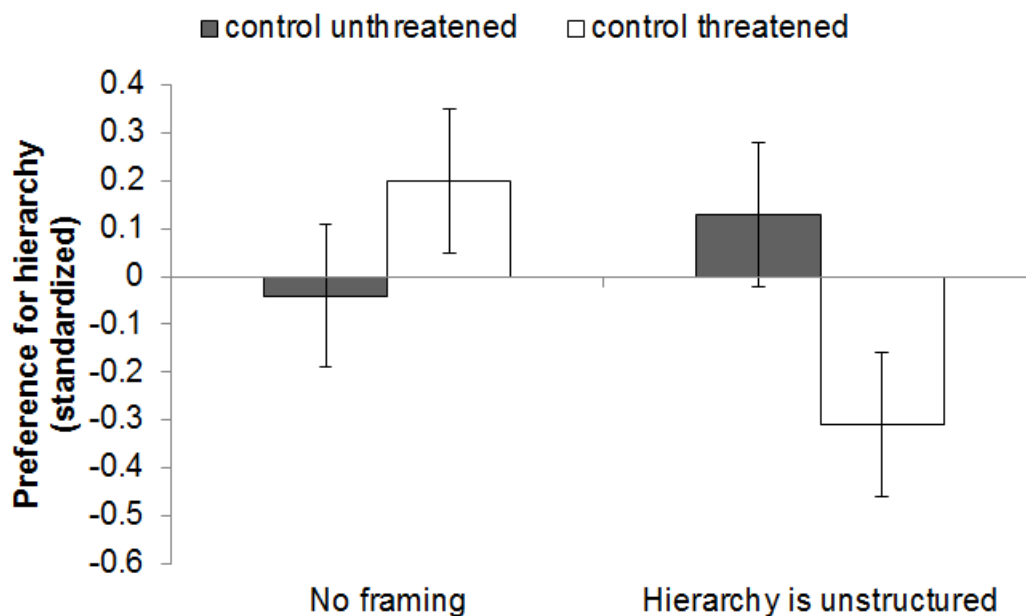
Hierarchical preferences were submitted to a 2 (Control threat condition: *threatened* vs. *unthreatened*) by 2 (Framing of hierarchy: *unstructured* vs. *no framing*) between-subjects ANOVA. There were no main effects, all p -values $> .21$. However, I expected that framing hierarchy as unstructured would interact with the control threat. As hypothesized there was a

⁷ When examined individually, both dependent variables showed the same pattern but the effect was stronger for the personal preference measure than the general preference measure (e.g., the predicted 2-way interaction between threat condition and hierarchy framing was $p = .01$ on personal preference but $p = .09$ on general preference).

significant two-way interaction, $F(1, 138) = 5.40, p = .02, \eta^2_p = .04$, which is illustrated in Figure 4.

As predicted, when hierarchy was framed as unstructured it became significantly less appealing for participants in the control threat compared to those in the unthreatened condition, $F(1, 70) = 5.04, p = .02, \eta^2_p = .07$. Additionally, participants in the threat condition preferred structured hierarchy more than unstructured hierarchy, $F(1, 67) = 5.94, p = .02, \eta^2_p = .08$. In the no framing conditions that matched those from Studies 3 and 4, the pattern was again replicated with control threat increasing preferences for hierarchy, although it did not reach significance in this instance, $F(1, 70) = 1.31, p = .26, \eta^2_p = .02$.

Figure 4. Effects of personal control manipulation and framing of hierarchies on preference for hierarchy (Study 5). Error bars represent standard error.



These results demonstrate an important insight into the psychological utility of hierarchies as a means of compensatory control. Although hierarchies are commonly perceived as being structured and thus are appealing after control threat, there may be circumstances when they are perceived as unstructured, such as when hierarchies are unstable, and therefore they become quite unappealing under control threat. These findings also support my contention that hierarchy's structure is what makes it appealing as a means of compensatory control; when the implications of hierarchy for structure are reversed—despite possessing other positive qualities like flexibility—hierarchies lose their compensatory appeal.

Study 6: Hierarchy Preference at Low and High Status

While some of the preference for hierarchy in Studies 3-5 may have been driven by expectations that hierarchies provide power and status, an especially strong test of my hypothesis would be to see whether personal control threat increases the appeal of hierarchy even when people expect to be in low-status positions. The lack of moderation by workplace status in Study 3 suggests that even low-status employees preferred hierarchy more after threat, but here I examine this possibility more directly. I also test preference for hierarchy in a new domain, job selection.

When considering different careers, those careers might differ in how much power and status they offer but also in whether they enhance or attenuate hierarchies. Hierarchy-enhancing jobs create or maintain group-based differences while hierarchy-attenuating jobs diminish group-based differences (Pratto & Espinoza, 2001; Pratto, Stallworth, Sidanius, & Siers, 1997). For example, the criminal justice system is disproportionately controlled by dominant groups and therefore prosecutors and police officers have hierarchy-enhancing roles as agents of the state (Sidanius, Pratto, Martin, & Stallworth, 1991). In contrast, public defenders have hierarchy-attenuating roles because they defend the subordinate groups who tend to have disproportionate contact with the criminal justice system (Sidanius, Liu, Shaw, & Pratto, 1994). To the extent that personal control threats elicit needs for structure, and to the extent that hierarchical jobs offer that structure regardless of one's position within the hierarchy, people who lack control should show an increased interest in hierarchy-enhancing jobs even when those jobs are low in status.

Method

Participants. I recruited 74 participants who were told the study was examining past experiences and job preferences. Five participants were excluded, leaving 69 (62% women, ages 18-71, Median = 29).

Materials and procedure. Participants first completed a personal control manipulation in which they recalled and wrote about an event that *threatened* ($n = 33$) or *did not threaten* ($n = 36$) personal control using the same manipulation as Study 2 (based on Whitson & Galinsky, 2008).

Next they read short descriptions (2-3 sentences) of twenty different jobs from five occupations (advertising, public relations, housing development, human resources, and librarian). The jobs were taken from past social dominance research (Pratto & Espinoza, 2001; Pratto, Stallworth, Sidanius, & Siers, 1997) in which they were categorized as hierarchy-enhancing or hierarchy-attenuating, and whether they were high in status or low in status. For example, one hierarchy-enhancing, high-status job was head of human resources with an emphasis on merit policies; the corresponding hierarchy-attenuating, high-status job was also head of human resources but with an emphasis on employment equity policies instead. Equivalent low-status jobs were human resources officers instead of department heads, again in either merit or employment equity roles. Participants indicated whether each job was appealing with a single item using a 9-point scale (1 = *not at all appealing* to 9 = *extremely appealing*).

Results & Discussion

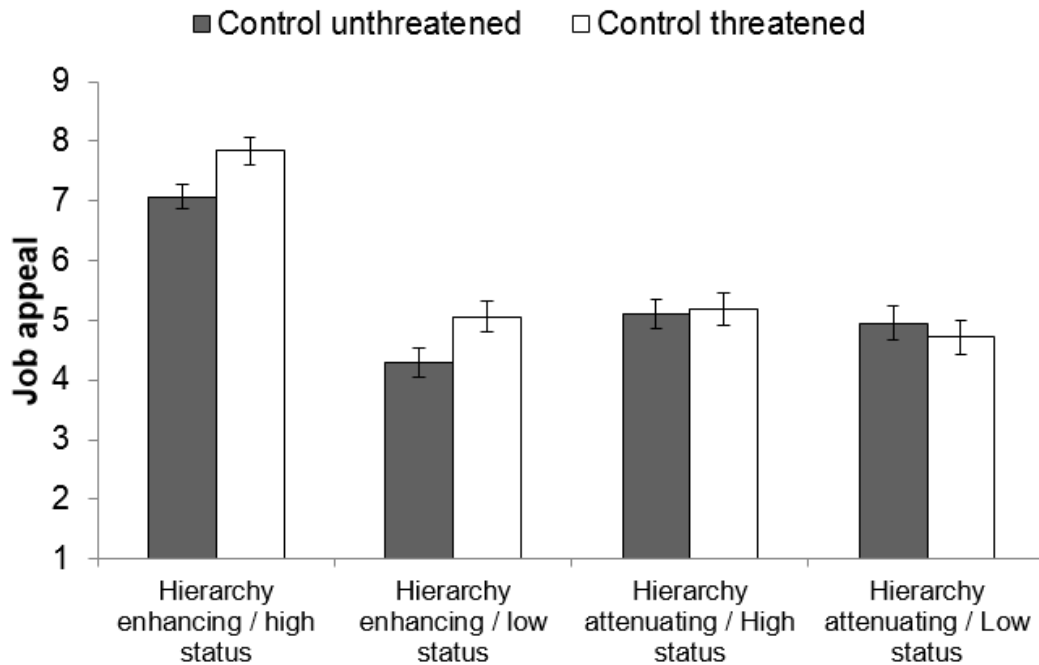
Job preferences were submitted to a 2 (Control threat manipulation: *threatened* vs. *unthreatened*) by 2 (Job hierarchy: *hierarchy-enhancing* vs. *hierarchy-attenuating*) by 2 (Job status: *high-status* vs. *low-status*) mixed design ANOVA, where the control manipulation was between-participants and job hierarchy and job status were within-participants. First, there were

two main effects. High-status jobs ($M = 4.98$, $SE = .16$) were preferred more than low-status jobs ($M = 4.76$, $SE = .15$), $F(1, 67) = 4.33$, $p = .04$, $\eta^2_p = .06$, and hierarchy-enhancing jobs ($M = 4.99$, $SE = .15$) were preferred more than hierarchy-attenuating jobs ($M = 4.5$, $SE = .16$), $F(1, 67) = 3.07$, $p = .09$, $\eta^2_p = .04$. There was no main effect of control threat, $F(1, 67) = 1.61$, $p = .21$, $\eta^2_p = .02$.

More importantly, the predicted two-way interaction between the control manipulation and job hierarchy emerged, $F(1, 67) = 9.93$, $p = .002$, $\eta^2_p = .13$, and the two-way interaction between the control manipulation and job status was not significant, $F < 1$, $\eta^2_p = .01$. That is, the control manipulation affected the appeal of hierarchy-enhancing jobs regardless of status. All other interactions were not significant, all p -values $> .20$. As predicted and shown in Figure 5, follow-up tests showed that participants in the control threat condition found hierarchy-enhancing jobs more appealing, compared to participants who were unthreatened, $F(1, 67) = 5.96$, $p = .02$, $\eta^2_p = .08$. The effect of threat was significant within both high status jobs, $t(67) = 2.51$, $p = .02$, $d = .55$, and low status jobs, $t(67) = 2.35$, $p = .02$, $d = .56$. The personal control manipulation did not affect the appeal of hierarchy-attenuating jobs, $F < 1$.⁸

⁸ Because previous work has shown that social dominance orientation (SDO; Pratto, Sidanius, Stallworth, & Malle, 1994) affects interest in hierarchy enhancing and attenuating jobs (Pratto & Espinoza, 2001), I measured SDO before any manipulations to control for its effect. The SDO₆ scale is 16 statements ($\alpha = .92$), including "It's probably a good thing that certain groups are at the top and other groups are at the bottom." and "No group should dominate in society" (reverse-scored). Zero-order correlations showed that SDO was positively but marginally associated with job appeal for the hierarchy-enhancing jobs, $r(67) = .21$, $p = .09$, and trended towards a negative correlation with job appeal for the hierarchy-attenuating jobs, $r(67) = -.13$, $p = .30$. This was the same pattern found in Pratto and Espinoza (2001). Analyses using multiple regression (as recommended by Aiken & West, 1991) showed that SDO did not interact with threat to predict the appeal of any of the four types of jobs, all p -values $= .16$ to $.56$ and that Study 6's results remained the same whether SDO was included in the model or not. The results presented do not control for SDO.

Figure 5. Effects of type of job and personal control threat on job appeal (Study 6). Error bars represent standard error.



The results of Study 6 are consistent with the idea that control threat induces a preference for jobs that form or maintain hierarchies specifically, even if those jobs are low in status. This study suggests, therefore, that one psychological benefit of hierarchy—the sense of structure it offers—may accrue even to individuals in subordinate positions, who are less likely to experience the more well-known benefits of hierarchical organization like power and status. Finally, this study demonstrates that preference for hierarchies after control threat occurs in domains that are consequential for the self—job choice—in addition to the more general attitudes towards workplace hierarchy investigated in Studies 3-5.

Secondary Analysis of Studies 3-6

Because the basic effect of threat on preference for hierarchy was nonsignificant within the no passage condition in Study 5, $p = .29$, and marginally significant in footnote 6, $p = .08$, I conducted a meta analysis (Hedges & Olkin, 1985) on Studies 3-6 and footnote 6, to get a better estimate of the significance and size of the threat effect of interest. The meta analysis produced a significant effect of control threat, Fisher's $Z = 4.32$, $p = .00001$, and a moderate average effect size, $d = .41$, suggesting that the effect is reliable across these studies.

General Discussion

Across six studies I demonstrated a motivational account for the ubiquity of social hierarchies within human society: The structured nature of hierarchies makes them well-suited to serve as a means of compensatory control. When personal control was threatened, participants perceived more hierarchy in ambiguous social interactions and reported increased support for hierarchies in organizations and occupational choice. The studies also investigated a psychological mechanism for the link from control threat to hierarchical preferences: perceptions of structure. Hierarchy was perceived to be more structured than equality and this structure was appealing to individuals high in a conceptually relevant individual difference, personal need for structure (Neuberg & Newsom, 1993), or even individuals low in PNS when they were under personal control threat. Furthermore, when hierarchy was depicted as less structured it was no longer appealing to those whose personal control was threatened. These findings bolster my interpretation that structure is the psychologically attractive component of hierarchies for those who lack control. Collectively, these studies provide the first evidence that social hierarchies can serve as a means of compensatory control.

The current research complements and extends two prevailing theories of hierarchy maintenance, system justification and social dominance. Both theories provide psychological mechanisms (system-justifying ideologies and hierarchy-enhancing myths, respectively) that account for people's tendency to justify and maintain hierarchies (see Jost & Hunyady, 2002, 2005; Sidanius, Levin, Federico, & Pratto, 2001), yet they differ in their focus on why people justify hierarchies. SDT emphasizes that hierarchy-maintenance is driven by high status groups' desire to maintain their dominance and control of economic resources (Levin, Federico, Sidanius, & Rabinowitz, 2002; Pratto, Stallworth, & Sidanius, 1997; Pratto, Stallworth, Sidanius,

& Siers, 1997; Sidanius, Liu, Shaw, & Pratto, 1994; Sidanius & Pratto, 1999). High status groups largely control their societies' symbolic resources (e.g., media, education) and they use these resources to disseminate ideologies that rationalize and legitimate hierarchy. These hierarchy-legitimizing ideologies tend to form hegemonic ideologies that are endorsed by many members of lower status groups despite the fact that these ideologies conflict with lower status group interests (Sidanius, Levin, & Pratto, 1996). In contrast, SJT emphasizes that, to the extent that hierarchies generally represent the status quo, hierarchy-maintenance can fulfill basic motivational needs to see one's sociopolitical systems as legitimate. These needs are hypothesized to be strongest among low-status groups (Jost, Pelham, & Carvallo, 2002; Jost, Pelham, Sheldon, & Sullivan, 2003), but are also held by high-status groups (Jost & Banaji, 1994). Although SDT also details the role of low-status groups in the perpetuation of hierarchy via consensual ideology (Sidanius, Levin, & Pratto, 1996; Sidanius & Pratto, 1999), relative to SJT it places less emphasis on low-status groups and the drive towards social dominance is theorized to be stronger among high-status groups (Sidanius & Pratto, 1999).

I expand on SJT and SDT by suggesting another motivation, distinct from status-based group interests or status quo rationalization, that may make hierarchy appealing even to those materially disadvantaged by hierarchy: the need to perceive the world as structured. The need for structure may be an especially powerful explanation of hierarchy preference because this motive is not contingent on power and status or status quo conditions but is a general psychological need held by both low-status and high-status group members. The desire to achieve structure through hierarchy can thus explain why people would be attracted to hierarchy even if they are in a relatively low social position or if hierarchy is not the status quo in their society or organization.

I suspect that often the motives of compensatory control work in concert with the motives described in SDT and SJT. A hierarchy that is structured, consistent with hierarchy legitimizing ideologies, and supports the status quo, is likely a hierarchy that meets a variety of distinct psychological needs. This may be one reason we often see such dramatic defenses of inequality. Of course, sometimes people might try to change the status quo to make it less hierarchical (e.g., Kay et al., 2009; Worthy, 1950), but my research suggests this might be difficult because equality is less psychologically plausible as a means of structure than hierarchical differentiation. If equality becomes an established status quo, however, then system-justification processes may result in its defense as well (e.g., van der Toorn, Berkics, & Jost, 2010). In this situation the system justification motive and the need for external structure and control would have opposing effects on preferences for hierarchy.

The current research also makes connections to several other theories of hierarchy preference. Relational Models Theory (A. P. Fiske, 1991) finds that there are four main cultural models of social relationships; the one most relevant to forming hierarchies is *authority ranking*. Typically, authority ranking models are described as driven by power motivations (A. P. Fiske, 1991) or personality factors such as low agreeableness (A. P. Fiske & Haslam 2005). My data suggest an additional underlying motivation, needs for control and structure, which might be an important source of motivation to endorse authority ranking values.

In other work, Deutsch (1985) describes the difficulty in awakening a sense of injustice among the oppressed. This desensitization to injustice is often driven by ideologies and myths that justify hierarchical social structures (e.g., that subordinate groups deserves their position; see also Lane, 1959). Deutsch notes that the legitimacy of these hierarchy-sustaining ideologies must often be weakened before disadvantaged individuals will demand change. But if these weakened

ideologies still serve disadvantaged individuals' needs for structure they may be motivated to retain them and the structures that produce them. This seems especially likely given that losses of personal control are common in the daily lives of subordinate groups and thus, presumably, needs for structure are often more chronically salient for them.

This work also contributes to our theoretical understanding of how Personal Need for Structure (Neuberg & Newsom, 1993) relates to ideologies of hierarchy-maintenance such as social dominance orientation (SDO; Pratto, Sidanius, Stallworth, & Malle, 1994), right-wing authoritarianism (RWA; Altemeyer, 1981), and political conservatism (Jost et al., 2003). Past work has shown correlationally that PNS produces prejudice and discrimination via mediation through SDO and RWA (e.g., Altemeyer, 1998; Heaven & Bucci, 2001; Van Hiel, Pandelaere, & Duriez, 2004). The current work bolsters these findings by providing experimental evidence that motivational needs for structure may contribute, in part, to the attractiveness of hierarchy.

Limitations and Alternative Explanations

The current studies used both direct (attitude) and indirect (job preference) operationalizations of preference for hierarchy. However, all the studies used experimental manipulations that depended on recalling a time when one lacked control or reading articles that claimed the world is uncontrolled. I chose these because they have been well-validated and shown to induce compensatory control strivings and a search for structure. Nonetheless, future research should consider alternative ways of manipulating the need for control such as by putting people in actual situations where they lack control (see, e.g., Donnerstein & Wilson, 1976). Future research might also explore these processes in the field, looking for natural experiments of control threat and testing for hierarchical preferences in actual organizations and social settings. Last, I conducted all of my studies online using samples of American adults. This

allowed me to recruit individuals with more employment experience than typical undergraduate samples, thereby increasing the generalizability of my findings, but future research would do well to include complementary laboratory methodology and test these relationships in other cultural samples.

I have argued that people who lack control seek out structure in their social environments and thus prefer hierarchies because they offer structure. It is possible, however, that the control threats that we used induced a need for power or status in our studies. If so, people might have preferred hierarchy because it offers an opportunity to exercise power over others or to have high status. While this account might be reasonable in individual studies, it becomes less plausible when considering the studies as a whole. Studies 5 and 6 in particular strongly suggest that preference for hierarchy induced by control threat cannot be reduced to needs for power exclusively. When hierarchies were framed as unstructured they became unappealing to control threatened participants; this lends evidence that structure is the key psychological ingredient that makes hierarchy appealing and thus serves as a means of compensatory control. Furthermore, threatened participants increased their interest in hierarchy-enhancing jobs but not in high-status jobs and when Study 3 controlled for participants' workplace status and therefore the effects of control threat on hierarchy preference and of workplace hierarchy on self-efficacy occurred independent of status. Also bolstering our structure-based account, PNS moderated the effects of threat (Study 5). To be clear, support for hierarchy is almost certainly rooted in needs for power and status under a great many circumstances; I only suggest that power is not sufficient as the lone explanation for the current findings. Future research could pit motivations for power and structure against one another (and perhaps related motivations like desire for choice; Inesi, Botti,

Dubois, Rucker, & Galinsky, 2011) to see how, and under what circumstances, each relates to preferences for hierarchy.

Given that hierarchy is an important feature of status quo social structures (Jost, Glaser, Kruglanski, & Sulloway, 2003; Sidanius & Pratto, 1999), one might wonder whether the motivated hierarchy preference documented in the present studies is just a special case of motivated status quo preference. While some of my results might be explained as reflecting a status quo preference, I believe that the weight of the evidence suggests that it is hierarchy's connection with structure, documented in Study 1, that motivates people to embrace hierarchy when their sense of control is threatened. For example, Study 5 provided evidence that motivated hierarchy preference is not just a special case of motivated status quo preference where I manipulated the association of hierarchy with structure but did not manipulate its association with the status quo. The fact that control threat lowered participants' preference for hierarchy when hierarchy was associated with disorder suggests that it is the association of hierarchy with order and not its association with the status quo that motivates people to embrace hierarchy when their control needs are high. Although the association of hierarchy with the status quo may be one reason that hierarchy is preferred when control is threatened, this association is not the only reason that control threat motivates hierarchy preference.

Future Directions

These studies explore the link between personal control and hierarchy within workplace and job selection contexts, but it remains to be seen whether this process generalizes to other domains. In future work, I will investigate preference for hierarchies within political and public policy contexts. Egalitarianism is particularly valued as an ideal within political domains (e.g., the Canadian Charter states that "Every individual is equal before and under the law..."). If

people turn to political hierarchy as a means of compensatory control, therefore, it would represent an especially strong test of my hypotheses. In an initial experiment in this new line of research I found support for this; participants whose sense of personal control was threatened scored higher on social dominance orientation (Pratto, Sidanius, Stallworth, & Malle, 1994), a measure of desire for intergroup hierarchy in socio-political contexts, compared to unthreatened participants. I also examined data from the World Values Survey, a representative sample of approximately 43,000 people from 57 countries, and found that lacking personal control was associated with increased support for hierarchical forms of government (e.g., strong leaders), controlling for demographic variables such as age, gender, social class, income, and political orientation. Importantly, however, lacking personal control was not associated with support for government hierarchy within countries with corrupt governments. As I continue this line of research I plan to investigate, for example, whether people are more likely to support hierarchical public policy interventions for social problems that are seen as less controllable (e.g., terrorist attacks, which are typically unexpected) relative to problems that are seen as more controllable (e.g., unemployment, which can have an element of individual responsibility).

In Search of Egalitarianism

Is hierarchy better or worse than equality? Hierarchy is often rife with unfairness and undeserved advantage that can be daunting to challenge. Yet for some organizational tasks or goals it may also be more efficient than flatter forms of social organization (Abramitzky, 2011; Halevy et al., 2011; Halevy et al., 2012; Ronay et al., 2012; Tiedens et al., 2007; Zitek & Tiedens, 2012, but see Deutsch, 1985; 2006; Maner & Mead, 2010). It may be important for activists who seek to dismantle illegitimate hierarchies to differentiate between the hierarchies

they oppose and these other types of hierarchies that people may have good reason to see as relatively fair and efficient.

If seeking to flatten illegitimate hierarchies, my evidence that control needs stimulate an affinity for hierarchy identifies a potentially important psychological barrier to egalitarian reforms in organizations and social institutions. Throughout history, movements that have sought to expand democracy and social equality have often been opposed by arguments that emphasize how the dismantling of established hierarchies will cause societal disorder and anarchy (Herzog, 1998; Hirschman, 1991). Thus, the association of hierarchy with order often serves as powerful propaganda to block egalitarian reform. My research suggests one reason why this propaganda is so persuasive: these arguments successfully capitalize on people's need to maintain a minimum sense of order and structure. However, my findings also suggest some framing strategies that egalitarian reformers might use to counteract resistance stemming from unfulfilled control needs. Study 5 shows that a strategy of highlighting the ways that hierarchy itself can be unpredictable and disorderly can convert the need for control from being a barrier to being an incentive for supporting egalitarian reform. A second strategy would be to highlight ways that structure and order can be achieved in non-hierarchical designs of organizations and institutions. A third strategy would be to make sure to always affirm an audience's personal control resources whenever calling for egalitarian reforms to established hierarchies. Egalitarian reform advocates should expect little success at winning over adherents to their cause if they neglect to use these or some other strategy to address their audience's control needs.

References

- Abrahamson, E. (2002). Disorganization theory and disorganizational behavior: Towards an etiology of messes. In B. M. Staw, & R. M. Kramer (Eds.), *Research in organizational behavior: An annual series of analytical essays and critical reviews*, vol. 24 (pp. 139-180). US: Elsevier. doi:10.1016/S0191-3085(02)24005-8
- Abramitzky, R. (2011). Lessons from the Kibbutz on the equality-incentives trade-off. *Journal of Economic Perspectives*, 25, 185-207. doi:10.1257/089533011798837783
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage.
- Altemeyer, B. (1981). *Right-wing authoritarianism*. Winnipeg, MB, Canada: University of Manitoba Press.
- Altemeyer, B. (1998). The other 'authoritarian personality.' In M. Zanna (Ed.), *Advances in Experimental Social Psychology*, vol. 30 (pp. 47-92). US: Academic Press. doi:10.1016/S0065-2601(08)60382-2
- Anderson, C., Willer, R., Killduff, G. J., & Brown, C. E. (2012). The origins of deference: When do people prefer low status? *Journal of Personality and Social Psychology*, 102, 1077-1088. doi:10.1037/a0027409
- Banfield, J. C., Kay, A. C., Cutright, K. M., Wu, E. C., & Fitzsimons, G. J. (2011). A person by situation account of motivated system defense. *Social Psychological and Personality Science*, 2, 212-219. doi:10.1177/1948550610386809
- Banfield, J. C., Nadolny, D., & Kay, A. C. (2013). Helping in a random world: Evidence that prosocial intentions and behavior can satiate compensatory control needs. Unpublished manuscript.

- Bargh, J. A. (1994). The four horsemen of automaticity: Awareness, intention, efficiency, and control in social cognition. In R. S. Wyer, Jr., & T. K. Srull (Eds.), *Handbook of social cognition*, 2nd ed. (pp. 1-40). Hillsdale, NJ, USA: Erlbaum.
- Baron, J. N., & Pfeffer, J. (1994). The social psychology of organizations and inequality. *Social Psychology Quarterly*, 57, 190-209. doi:10.2307/2786876
- Bellah, R. N., Madsen, R., Sullivan, W. M., Swidler, A., & Tipton, S. M. (1996). *Habits of the heart: Individualism and commitment in American life*. London, UK: University of California Press.
- Berrett, D. (2011, October 16). Intellectual Roots of Wall St. Protest Lie in Academe. *The Chronicle of Higher Education*, retrieved from: <http://chronicle.com/article/Intellectual-Roots-of-Wall/129428/>
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, 6, 3-5. doi:10.1177/1745691610393980
- Burger, J. M., & Cooper, H. M. (1979). The desirability of control. *Motivation and Emotion*, 3, 381-393. doi:10.1007/BF00994052
- Carlson, K. B. (2011, November 25). Occupy Wall Street plagued by the hierarchy it seeks to destroy. *The National Post*. Retrieved from <http://news.nationalpost.com/2011/11/25/occupy-wall-street-plagued-by-the-hierarchy-it-seeks-to-destroy/>
- Chipperfield, J. G., Newall, N. E., Perry, R. P., Stewart, T. L., Bailis, D. S., & Ruthig, J. C. (2012). Sense of control in late life: Health and survival implications. *Personality and Social Psychology Bulletin*, 38, 1081-1092. doi:10.1177/0146167212444758

- Chonko, L. B. (1982). The relationship of span of control to sales representatives' experienced role conflict and role ambiguity. *The Academy of Management Journal*, 25, 452-456.
doi:10.2307/256004
- Clarke, F. M., & Faulkes, C. G. (1997). Dominance and queen succession in captive colonies of the eusocial naked mole-rat, *heterocephalus glaber*. *Proceedings of the Royal Society of London*, 264, 993-1000. doi:10.1098/rspb.1997.0137
- Cutright, K. M. (2012). The beauty of boundaries: Why and when we seek structure in consumption. *Journal of Consumer Research*, 38, 775-790. doi:10.1086/661563
- Deutsch, M. (1985). *Distributive justice: A social psychological perspective*. New Haven, CT: Yale University Press.
- Deutsch, M. (2006). A framework for thinking about oppression and its change. *Social Justice Research*, 19, 7-41. doi:10.1007/s11211-006-9998-3
- Donnerstein, E., & Wilson, D. W. (1976). Effects of noise and perceived control on ongoing and subsequent aggressive behavior. *Journal of Personality and Social Psychology*, 34, 774-781.
doi:10.1037//0022-3514.34.5.774
- Duckitt, J., & Sibley, C. G. (2009). A dual-process motivational model of ideology, politics, and prejudice. *Psychological Inquiry*, 20, 98-109. doi:10.1080/10478400903028540
- Dumont, L. (1980). *Homo hierarchicus: The caste system and its implications*. Chicago, IL: University of Chicago Press.
- Eagly, A. H., & Karau, S. J. (1991). Gender and the emergence of leaders: A meta-analysis. *Journal of Personality and Social Psychology*, 60, 685-710. doi:10.1037/0022-3514.60.5.685

- Eccleston, C. P., Kaiser, C. R., & Kraynak, L. R. (2010). Shifts in justice beliefs induced by Hurricane Katrina: The impact of claims of racism. *Group Processes and Intergroup Relations*, 13, 571-584. doi:10.1177/1368430210362436
- Fehr, B. (1988). Prototype analysis of the concepts of love and commitment. *Journal of Personality and Social Psychology*, 55, 557-579. doi:10.1037/0022-3514.55.4.557
- Fiske, A. P. (1991). *Structures of social life: The four elementary forms of human relations: Communal sharing, authority ranking, equality matching, market pricing*. New York, NY: Free Press.
- Fiske, A. P., & Haslam, N. (2005). The four basic social bonds: Structures for coordinating interaction. In M. W. Baldwin (Ed.), *Interpersonal cognition* (pp. 267-298). New York, NY: Guilford Press.
- Fiske, S. T. (2011). *Envy up, scorn down: How status divides us*. New York, NY: Russell Sage Foundation.
- Gaucher, D., Hafer, C. L., Kay, A. C., & Davidenko, N. (2010). Compensatory rationalizations and the resolution of everyday undeserved outcomes. *Personality and Social Psychology Bulletin*, 36, 109-118. doi:10.1177/0146167209351701
- Gaucher, D, Kay, A. C., & Laurin, K. (2010). The power of the status quo: Consequences for maintaining and perpetuating inequality. In R. Bobocel, A. C. Kay, M. P. Zanna, , & J. M. Olson (Eds.), *The psychology of justice and legitimacy: Ontario symposium on personality and social psychology, vol. 11*, (pp. 151-170). New York, NY: Psychology Press.
- Gilson, D. (2011, October 10). Charts: Who Are the 1 Percent? *Mother Jones*, retrieved from: <http://www.motherjones.com/mojo/2011/10/one-percent-income-inequality-OWS>

- Glass, D. C., Singer, J. E., & Friedman, L. N. (1969). Psychic cost of adaptation to an environmental stressor. *Journal of Personality and Social Psychology*, 12, 200-210.
doi:10.1037/h0027629
- Glick, P. & Fiske, S. T. (2001). An ambivalent alliance: Hostile and benevolent sexism as complimentary justifications for gender inequality. *American Psychologist*, 56, 109-118.
doi:10.1037//0003-066X.56.2.109
- Gould, R. V. (2002). The origins of status hierarchies: A formal theory and empirical test. *American Journal of Sociology*, 107, 1143-1178. doi:10.1086/341744
- Gruenfeld, D. H., & Tiedens, L. Z. (2010). In S. T. Fiske, D. T. Gilbert, and G. Lindzey (Eds.), *Organizational preferences and their consequences*. Hoboken, NJ: John Wiley & Sons.
- Halevy, N., Chou, E. Y., & Galinsky, A. D. (2011). A functional model of hierarchy: Why, how, and when vertical differentiation enhances group performance. *Organizational Psychology Review*, 1, 32-52. doi:10.1177/2041386610380991
- Halevy, N., Chou, E. Y., Galinsky, A. D., & Murnighan, J. K. (2012). When hierarchy wins: Evidence from the national basketball association. *Social Psychological and Personality Science*, 3, 398-406. doi:10.1177/1948550611424225
- Heaven, P. C. L., & Bucci, S. (2001). Right-wing authoritarianism, social dominance orientation and personality: An analysis using the IPIP measure. *European Journal of Personality*, 15, 49-56. doi:10.1002/per.389
- Hedges, L. V., & Olkin, I. (1985). *Statistical methods for meta-analysis*. Orlando, FL: Academic Press.
- Herzog, D. (1998). *Poisoning the minds of the lower orders*. Princeton, NJ: Princeton University Press.

- Hirschman, A. O. (1991). *The rhetoric of reaction: Perversity, futility, jeopardy*. Cambridge, MA: Harvard University Press.
- Inesi, M. E., Botti, S., Dubois, D., Rucker, D. D., & Galinsky, A. D. (2011). Power and choice: Their dynamic interplay in quenching the thirst for personal control. *Psychological Science*, 22, 1042-1048. doi:10.1177/0956797611413936
- Jantti, M., Bratsberg, B., Roed, K., Raaum, O., Naylor, R., Osterbacka, E., & Eriksson, T. (2006). *American exceptionalism in a new light: A comparison of intergenerational earnings mobility in the Nordic countries, the United Kingdom, and the United States*. (No. 1938). Bonn, Germany: Institute for the Study of Labor (IZA).
- Jones, J. M. (2003, September 9). Sept. 11 effects, though largely faded, persist. *The Gallup Poll*. Retrieved on June 30, 2011 from www.gallup.com/poll/9208/Sept-Effects-Though-Largely-Faded-Persist.aspx
- Jordan, J., Sivanathan, N., & Galinsky, A. D. (2011). Something to lose and nothing to gain: The role of stress in the interactive effect of power and stability on risk taking. *Administrative Science Quarterly*, 56, 530-558. doi:10.1177/0001839212441928
- Jost, J. T., & Banaji, M. R. (1994). The role of stereotyping in system-justification and the production of false consciousness. *British Journal of Social Psychology*, 33, 1-27. doi:10.1111/j.2044-8309.1994.tb01008.x
- Jost, J. T., Banaji, M. R., & Nosek, B. A. (2004). A decade of system justification theory: Accumulated evidence of conscious and unconscious bolstering of the status quo. *Political Psychology*, 25, 881-919. doi:10.1111/j.1467-9221.2004.00402.x

- Jost, J. T., Glaser, J., Kruglanski, A. W., & Sulloway, F. J. (2003). Political conservatism as motivated social cognition. *Psychological Bulletin*, 129, 339-375. doi:10.1037/0033-2909.129.3.339
- Jost, J. T., & Hunyady, O. (2002). The psychology of system justification and the palliative function of ideology. In W. Stroebe, & M. Hewstone (Eds.), *European review of social psychology*, vol. 13 (pp. 111-153). Hove, UK: Psychology Press/Taylor & Francis.
- Jost, J. T., & Hunyady, O. (2005). Antecedents and consequences of system-justifying ideologies. *Current Directions in Psychological Science*, 14, 260-265. doi:10.1111/j.0963-7214.2005.00377.x
- Jost, J. T., & Kay, A. C. (2005). Exposure to benevolent sexism and complementary gender stereotypes: Consequences for specific and diffuse forms of system justification. *Journal of Personality and Social Psychology*, 88, 498-509. doi:10.1037/0022-3514.88.3.498
- Jost, J. T., Pelham, B. W., & Carvallo, M. R. (2002). Non-conscious forms of system justification: Implicit and behavioral preferences for higher status groups. *Journal of Experimental Social Psychology*, 38, 586-602. doi:10.1016/S0022-1031(02)00505-X
- Jost, J. T., Pelham, B. W., Sheldon, O., & Sullivan, B. N. (2003). Social inequality and the reduction of ideological dissonance on behalf of the system: Evidence of enhanced system justification among the disadvantaged. *European Journal of Social Psychology*, 33, 13-36. doi:10.1002/ejsp.127
- Kaiser, C. R., Major, B., Jurcevic, I., Dover, T. L., Brady, L. et al. (2013). Presumed fair: Ironic effects of organizational diversity structures. *Journal of Personality and Social Psychology*, 104, 504-519. doi:10.1037/a0030838

- Kay, A. C., Czapliński, S., & Jost, J. T. (2009). Left-right ideological differences in system justification following exposure to complementary versus noncomplementary stereotype exemplars. *European Journal of Social Psychology, 39*, 290-298. doi:10.1002/ejsp.500
- Kay, A. C., Gaucher, D., Napier, J. L., Callan, M. J., & Laurin, K. (2008). God and the government: Testing a compensatory control mechanism for the support of external systems. *Journal of Personality and Social Psychology, 95*, 18–35. doi:10.1037/0022-3514.95.1.18
- Kay, A. C., Gaucher, D., Peach, J. M., Laurin, K., Friesen, J., Zanna, M. P., & Spencer, S. J. (2009). Inequality, discrimination, and the power of the status quo: Direct evidence for a motivation to see the way things are as the way they should be. *Journal of Personality and Social Psychology, 97*, 421-434. doi:10.1037/a0015997
- Kay, A. C., & Jost, J. T. (2003). Complementary justice: Effects of "poor but happy" and "poor but honest" stereotype exemplars on system justification and implicit activation of the justice motive. *Journal of Personality and Social Psychology, 85*, 823-837. doi:10.1037/0022-3514.85.5.823
- Kay, A. C., Moscovitch, D. A., & Laurin, K. (2010). Randomness, attributions of arousal, and belief in god. *Psychological Science, 21*, 216-218. doi:10.1177/0956797609357750
- Kay, A. C., Shepherd, S., Blatz, C. W., Chua, S. N., & Galinsky, A. D. (2010). For god (or) country: The hydraulic relation between government instability and belief in religious sources of control. *Journal of Personality and Social Psychology, 99*, 725-739. doi:10.1037/a0021140
- Kay, A. C., Landau, M. J., Sullivan, D. L. (in press, 2013). Agency and control. In J. Bargh & E. Borgida (Eds.), *APA Handbook of Personality and Social Psychology: Attitudes and Social Cognition*. Washington, DC: American Psychological Association.

- Kay, A. C., Whitson, J. A., Gaucher, D., & Galinsky, A. D. (2009). Compensatory control: Achieving order through the mind, our institutions, and the heavens. *Current Directions in Psychological Science*, 18, 264-268. doi:10.1111/j.1467-8721.2009.01649.x
- Kelly, G. A. (1955). *The psychology of personal constructs*. New York: Norton.
- Kluegel, J. R., & Smith, E. R. (1986). *Beliefs about inequality: Americans' views of what is and what ought to be*. Piscataway, NJ: Aldine Transaction.
- Krackhardt, D., & Kilduff, M. (1999). Whether close or far: Social distance effects on perceived balance in friendship networks. *Journal of Personality and Social Psychology*, 76, 770-782. doi:10.1037/0022-3514.76.5.770
- Landau, M. J., Greenberg, J., Solomon, S., Pyszczynski, T., & Martens, A. (2006). Windows into nothingness: Terror management, meaninglessness, and negative reactions to modern art. *Journal of Personality and Social Psychology*, 90, 879-892. doi:10.1037/0022-3514.90.6.879
- Lane, R. E. (1959). The fear of equality, *American Political Science Review*, 53, 35-51. doi:10.2307/1951729
- Laurin, K., Kay, A. C., & Moscovitch, D. A. (2008). On the belief in god: Towards an understanding of the emotional substrates of compensatory control. *Journal of Experimental Social Psychology*, 44, 1559-1562. doi:10.1016/j.jesp.2008.07.007
- Laurin, K., Shepherd, S., & Kay, A. C. (2010). Restricted emigration, system inescapability, and the defense of the status quo: System-justifying consequences of restricted exit opportunities. *Psychological Science*, 21, 1075-1082. doi:10.1177/0956797610375448

- Leary, M. R., Cottrell, C. A., & Phillips, M. (2001). Deconfounding the effects of dominance and social acceptance on self-esteem. *Journal of Personality and Social Psychology*, 81, 898-909. doi:10.1037/0022-3514.81.5.898
- Levin, S., Frederico, C. M., Sidanius, J., & Rabinowitz, J. L. (2002). Social dominance orientation and intergroup bias: The legitimization of favoritism for high-status groups. *Personality and Social Psychology Bulletin*, 28, 144-157. doi:10.1177/0146167202282002
- Magee, J. C., & Galinsky, A. D. (2008). Social hierarchy: The self-reinforcing nature of power and status. *The Academy of Management Annals*, 2, 351-398. doi:10.1080/19416520802211628
- Malahy, L. W., Rubinlicht, M. A., & Kaiser, C. R. (2009). Justifying inequality: A cross-temporal investigation of U.S. income disparities and just-world beliefs from 1973 to 2006. *Social Justice Research*, 22, 369-383. doi:10.1007/s11211-009-0103-6
- Maner, J., & Mead, N. L. (2010). The essential tension between leadership and power: When leaders sacrifice group goals for the sake of self-interest. *Journal of Personality and Social Psychology*, 99, 482-497. doi: 10.1037/a0018559
- Mason, W., & Suri, S. (2012). Conducting behavioral research on Amazon's Mechanical Turk. *Behavioral Research Methods*, 44, 1-23. doi: 10.3758/s13428-011-0124-6
- Myrdal, G. (1944/1996). *An American dilemma: The negro problem and modern democracy*. New Brunswick, NJ: Transaction Publishers.
- Nail, P. R., & McGregor, I. (2009). Conservative shift among liberals and conservatives following 9/11/01. *Social Justice Research*, 22, 231-240. doi:10.1007/s11211-009-0098-z

- Nail, P. R., McGregor, I., Drinkwater, A. E., Steele, G. M., & Thompson, A. W. (2009). Threat causes liberals to think like conservatives. *Journal of Experimental Social Psychology*, 45, 901-907. doi:10.1016/j.jesp.2009.04.013
- Napier, J. L., Mandisodza, A. N., Andersen, S. M., & Jost, J. T. (2006). System justification in responding to the poor and displaced in the aftermath of Hurricane Katrina. *Analyses of Social Issues and Public Policy*, 6, 57-73. doi:10.1111/j.1530-2415.2006.00102.x
- Neuberg, S. L., & Newsom, J. T. (1993). Personal need for structure: Individual differences in the desire for simpler structure. *Journal of Personality and Social Psychology*, 65, 113-131. doi:10.1037/0022-3514.65.1.113
- Norton, M. I., & Ariely, D. (2011). Building a better America – One wealth quintile at a time. *Perspectives on Psychological Science*, 6, 9-12. doi:10.1177/1745691610393524
- Paolacci, G., Chandler, J., & Ipeirotis, P. G. (2010). Running experiments on Amazon Mechanical Turk. *Judgment and Decision Making*, 5, 411-420.
- Pennebaker, J. W., & Stone, L. D. (2004). Translating traumatic experiences into language: Implications for child abuse and long-term health. In L. J. Koenig, L. S. Doll, A. O'Leary & W. Pequegnat (Eds.), *From child sexual abuse to adult sexual risk: Trauma, revictimization, and intervention* (pp. 201-216). Washington, DC: American Psychological Association. doi:10.1037/10785-010
- Pratto, F., & Espinoza, P. (2001). Gender, ethnicity, and power. *Journal of Social Issues*, 57, 763-780. doi:10.1111/0022-4537.00240
- Pratto, F., Sidanius, J., Stallworth, L. M., & Malle, B. F. (1994). Social dominance orientation: A personality variable predicting social and political attitudes. *Journal of Personality and Social Psychology*, 67, 741-763. doi:10.1037/0022-3514.67.4.741

- Pratto, F., Stallworth, L. M., & Sidanius, J. (1997). The gender gap: Differences in political attitudes and social dominance orientation. *British Journal of Social Psychology*, 36, 49-68. doi:10.1111/j.2044-8309.1997.tb01118.x
- Pratto, F., Stallworth, L. M., Sidanius, J., & Siers, B. (1997). The gender gap in occupational role attainment: A social dominance approach. *Journal of Personality and Social Psychology*, 72, 37-53. doi:10.1037/0022-3514.72.1.37
- Ronay, R., Greenaway, K., Anicich, E. M., & Galinsky, A. D. (2012). The path to glory is paved with hierarchy: When hierarchical differentiation increases group effectiveness. *Psychological Science*, 23, 669-677. doi:10.1177/0956797611433876
- Rothbaum, F., Weisz, J. R., & Snyder, S. S. (1982). Changing the world and changing the self: A two-process model of perceived control. *Journal of Personality and Social Psychology*, 42, 5-37. doi:10.1037/0022-3514.42.1.5
- Rothschild-Whitt, J. (1979). The collectivist organization: An alternative to rational-bureaucratic models. *American Sociological Review*, 44, 509-527. doi:10.2307/2094585
- Rutjens, B. T., van der Pligt, J., & van Harreveld, F. (2010). Deus or Darwin: Randomness and belief in theories about the origin of life. *Journal of Experimental Social Psychology*, 46, 1078-1080. doi:10.1016/j.jesp.2010.07.009
- Rutjens, B. T., van Harreveld, F., & van der Pligt, J. (2010). Yes we can: Belief in progress as compensatory control. *Social Psychological and Personality Science*, 1, 242-252. doi:10.1177/1948550610361782
- Rutjens, B. T., van Harreveld, F., van der Pligt, J., Kreemers, L. M., & Noordewier, M. K. (2013). Steps, stages, and structure: Finding compensatory order in scientific theories. *Journal of Experimental Psychology: General*, 142, 313-318. doi:10.1037/a0028716

- Sadler, P., & Woody, E. (2003). Is who you are who you're talking to? Interpersonal style and complementarity in mixed-sex interactions. *Journal of Personality and Social Psychology*, 84, 80-96. doi:10.1037/0022-3514.84.1.80
- Sapolsky, R. M. (2005). The influence of social hierarchy on primate health. *Science*, 308, 648-652. doi:10.1126/science.1106477
- Seligman, M. E. P. (1975). *Helplessness: On depression, development, and death*. New York, NY: W. H. Freeman.
- Shaer, M. (2013, 16 June). The boss stops here. *New York Magazine*. Retrieved from: <http://nymag.com/news/features/bossless-jobs-2013-6/>
- Shepherd, S., Kay, A. C., Landau, M. J., & Keefer, L. A. (2011). Evidence for the specificity of control motivations in worldview defense: Distinguishing compensatory control from uncertainty management and terror management processes. *Journal of Experimental Social Psychology*, 47, 949-958. doi:10.1016/j.jesp.2011.03.026
- Sidanius, J., Levin, S., Federico, C. M., & Pratto, F. (2001). Legitimizing ideologies: The social dominance approach. In J. T. Jost, & B. Major (Eds.), *The psychology of legitimacy: Emerging perspectives on ideology, justice, and intergroup relations* (pp. 307-331). Cambridge, UK: Cambridge University Press.
- Sidanius, J., Levin, S., & Pratto, F. (1996). Consensual social dominance orientation and its correlates within the hierarchical structure of American society. *International Journal of Intercultural Relations*, 20, 385-408. doi:10.1016/0147-1767(96)00025-9
- Sidanius, J., Liu, J. H., Shaw, J. S., & Pratto, F. (1994). Social dominance orientation, hierarchy attenuators and hierarchy enhancers: Social dominance theory and the criminal justice

- system. *Journal of Applied Social Psychology*, 24, 338-366. doi:10.1111/j.1559-1816.1994.tb00586.x
- Sidanius, J., & Pratto, F. (1999). *Social dominance: An intergroup theory of social hierarchy and oppression*. New York, NY: Cambridge University Press.
- Sidanius, J., Pratto, F., Martin, M., Stallworth, L. M. (1991). Consensual racism and career track: Some implications of social dominance theory. *Political Psychology*, 12, 691-721. doi:10.2307/3791552
- Silverman, R. E. (2012, June 20). Who's the boss? There isn't one. *The Wall Street Journal*, p. B1.
- Srull, T. K., & Wyer, R. S. (1979). The role of category accessibility in the interpretation of information about persons: Some determinants and implications. *Journal of Personality and Social Psychology*, 37, 1660-1672. doi:10.1037/0022-3514.37.10.1660
- Sullivan, D., Landau, M. J., & Rothschild, Z. K. (2010). An existential function of enemyship: Evidence that people attribute influence to personal and political enemies to compensate for threats to control. *Journal of Personality and Social Psychology*, 98, 434-449. doi:10.1037/a0017457
- Taylor, S. E., & Lobel, M. (1989). Social comparison activity under threat: Downward evaluation and upward contacts. *Psychological Review*, 96, 569-575. doi:10.1037/0033-295X.96.4.569
- Tiedens, L. Z., Unzueta, M. M., & Young, M. J. (2007). An unconscious desire for hierarchy? The motivated perception of dominance complementarity in task partners. *Journal of Personality and Social Psychology*, 93, 402-414. doi:10.1037/0022-3514.93.3.402

- van der Toorn, J., Berkics, M., & Jost, J. T. (2010). System justification, satisfaction, and perceptions of fairness and typicality at work: A cross-system comparison involving the U.S. and Hungary. *Social Justice Research, 23*, 189-210.
- Van Hiel, A., Pandelaere, M., & Duriez, B. (2004). The impact of need for closure on conservative beliefs and racism: Differential mediation by authoritarian submission and authoritarian dominance. *Personality and Social Psychology Bulletin, 30*, 824-837. doi:10.1177/0146167204264333
- Weber, M. (1947/1964). *The theory of social and economic organization*. New York, NY: Free Press.
- Webster, D. M., & Kruglanski, A. W. (1994). Individual differences in need for cognitive closure. *Journal of Personality and Social Psychology, 67*, 1049-1062. doi:10.1037/0022-3514.67.6.1049
- Weisbrod, A., Shapiro, A., Vasserman, G., Edry, L., Dayan, M., et al. (2013). Automated long-term tracking and social behavioural phenotyping of animal colonies within a semi-natural environment. *Nature Communications, 4*, 1-10. doi:10.1038/ncomms3018
- Whitson, J. A., & Galinsky, A. D. (2008). Lacking control increases illusory pattern perception. *Science, 322*(5898), 115-117. doi:10.1126/science.1159845
- Worthy, J. C. (1950). Organizational structure and employee morale. *American Sociological Review, 15*, 169-179. doi:10.2307/2086780
- Zitek, E. M., & Tiedens, L. Z. (2012). The fluency of social hierarchy: The ease with which hierarchical relationships are seen, remembered, learned, and liked. *Journal of Personality and Social Psychology, 102*, 98-115. doi:10.1037/a0025345